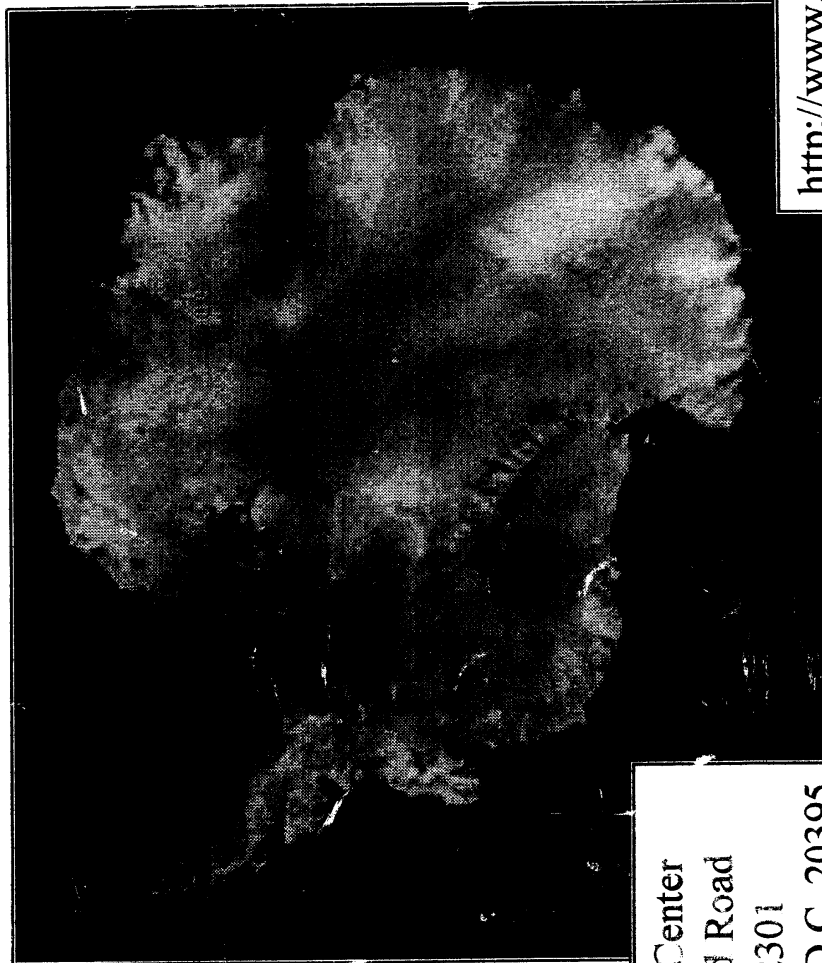




# National Ice Center Antarctic Sea Ice Atlas 1997

19990722 021



National Ice Center  
4251 Suitland Road  
FB4, Room 2301  
Washington D.C. 20395

<http://www.natice.noaa.gov>

**DISTRIBUTION STATEMENT A**  
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## PREFACE

The National Ice Center (NIC), under sponsorship of the United States Navy, the United States Coast Guard, and the National Oceanic and Atmospheric Administration (NOAA), provides sea ice analyses encompassing the "Arctic" and the "Antarctic". These analyses continue the data set established under our previous name, the Joint Ice Center. These atlases continue the near real-time integration of remotely sensed data and point observations and differ only in that the Arctic and Antarctic are split into two separate publications per hemisphere per year.

This publication is the 12<sup>th</sup> edition of the annual "Antarctic Sea Ice Atlas" published in hard copy format by the NIC. The atlas contains weekly charts depicting the sea ice extent and coverage in the Southern Hemisphere from the first week of January through October 1997. During the last week of October 1997, the Antarctic paper charts were replaced by digital charts in a Graphics Interface Format (\*.GIF). Printouts of the digital GIF charts for all Antarctic regions are contained in Supplement I to the "Antarctic Sea Ice Atlas". Future annual atlases will be available in a digital format on CD-ROM through the National Snow and Ice Data Center (<http://www-nsidc.colorado.edu>). NSIDC is the official archive center for the NIC.

The NIC uses a wide variety of data sources in the production of sea ice analyses. Table 1 lists the data sources used to produce the Antarctic weekly ice analyses contained in this publication. The line types used in the analyses provide metadata information with regard to sensor type. Solid lines depict boundaries derived from: point observations, Defense Meteorological Satellite Program Operational Line Scan (DMSP OLS) and NOAA Advanced Very High-Resolution Radiometer (AVHRR) data. Dash-dash-dotted line depicts boundaries derived from DMSP Special Sensor Microwave Imager (SSM/I), and dashed lines depict boundaries derived from forecast models and climatology.

Please direct questions or comments to the NIC Liaison Branch, at phone number (301) 457-5303 extension 311 or 303, facsimile number (301) 457-5300, or electronic mail address: [liaison@natice.noaa.gov](mailto:liaison@natice.noaa.gov)

**Atlas addendum:** This publication is intended to serve as an interim solution, while transitioning to distribution via CD-ROM. The purpose of this atlas is to make all National Ice Center (NIC) sea ice charts available to customers using NIC designated archive centers. By fall 1999, it is anticipated that NIC will complete and distribute Arctic/Antarctic ice atlases on CD-ROM for 1995, 1996, 1997 and 1998. It should be noted that the charts presented in this atlas have been drawn by hand for operational use. Corrections to "hand annotations" are visible on some of the charts in the atlases.

From	To	Sensor Platform	Sensor and Type	Spectral Region	Resolution	Coverage
01-97	12-97	DMSP F-10, 11, 12, 13, 14	OLS Fine: VIS IR SSM/I	0.4 to 1.1 $\mu$ m 10.2 to 12.8 $\mu$ m 19.35 and 37GHz	0.55 km  25 km	3,012km  3,012km
01-97	12-97	NOAA 12, 14	AVHRR: HRPT/LAC VIS NIR IR	0.58 to 0.68 $\mu$ m 0.72 to 1.10 $\mu$ m 3.55 to 3.93 $\mu$ m	1.1km at nadir; 2.5km at swath edge	4,000km

**TABLE 1. 1997 Antarctic Satellite Data Sources**

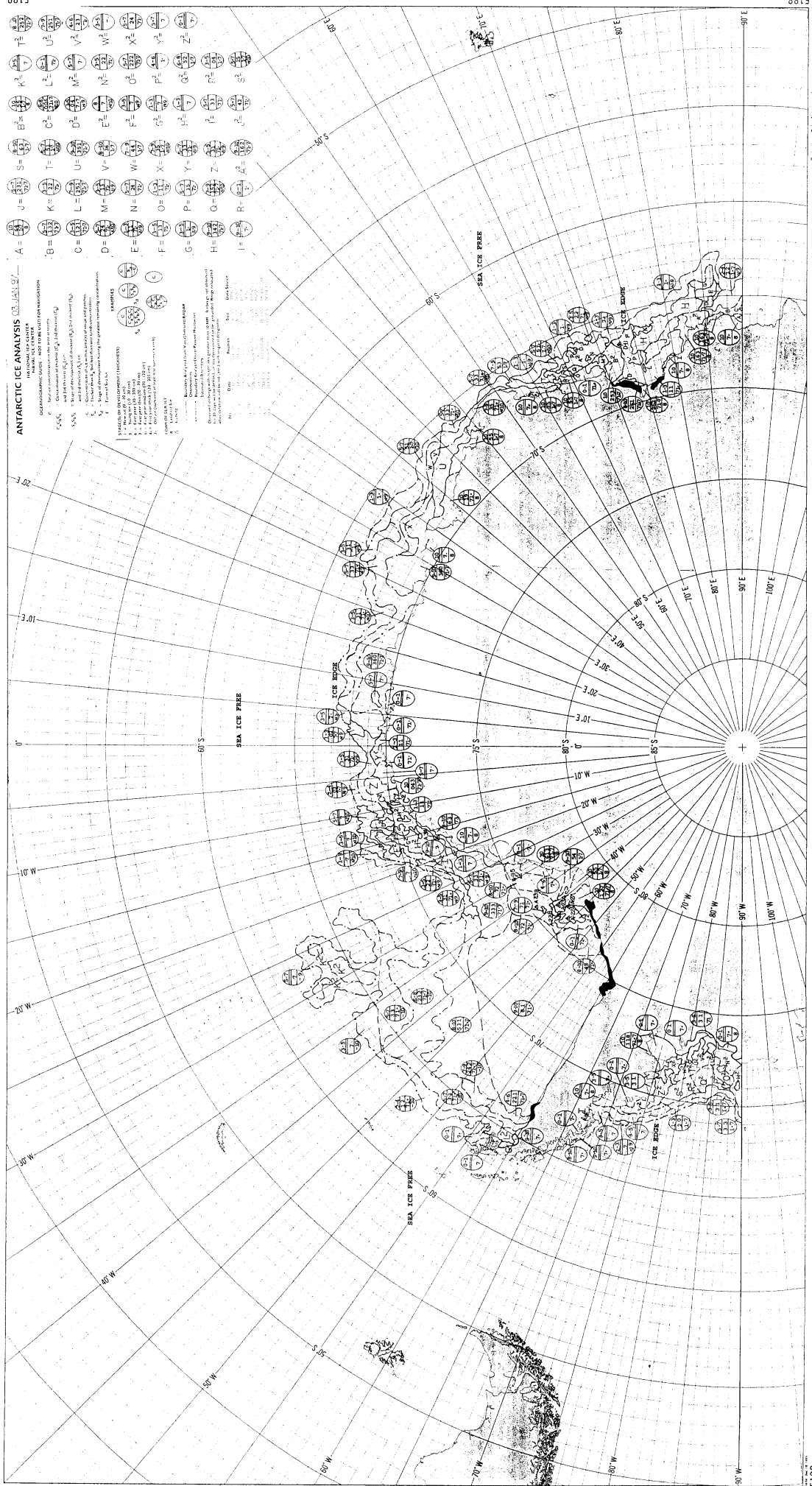
Note: DMSP F-14 launched 04/15/97

### Abbreviations and Acronyms:

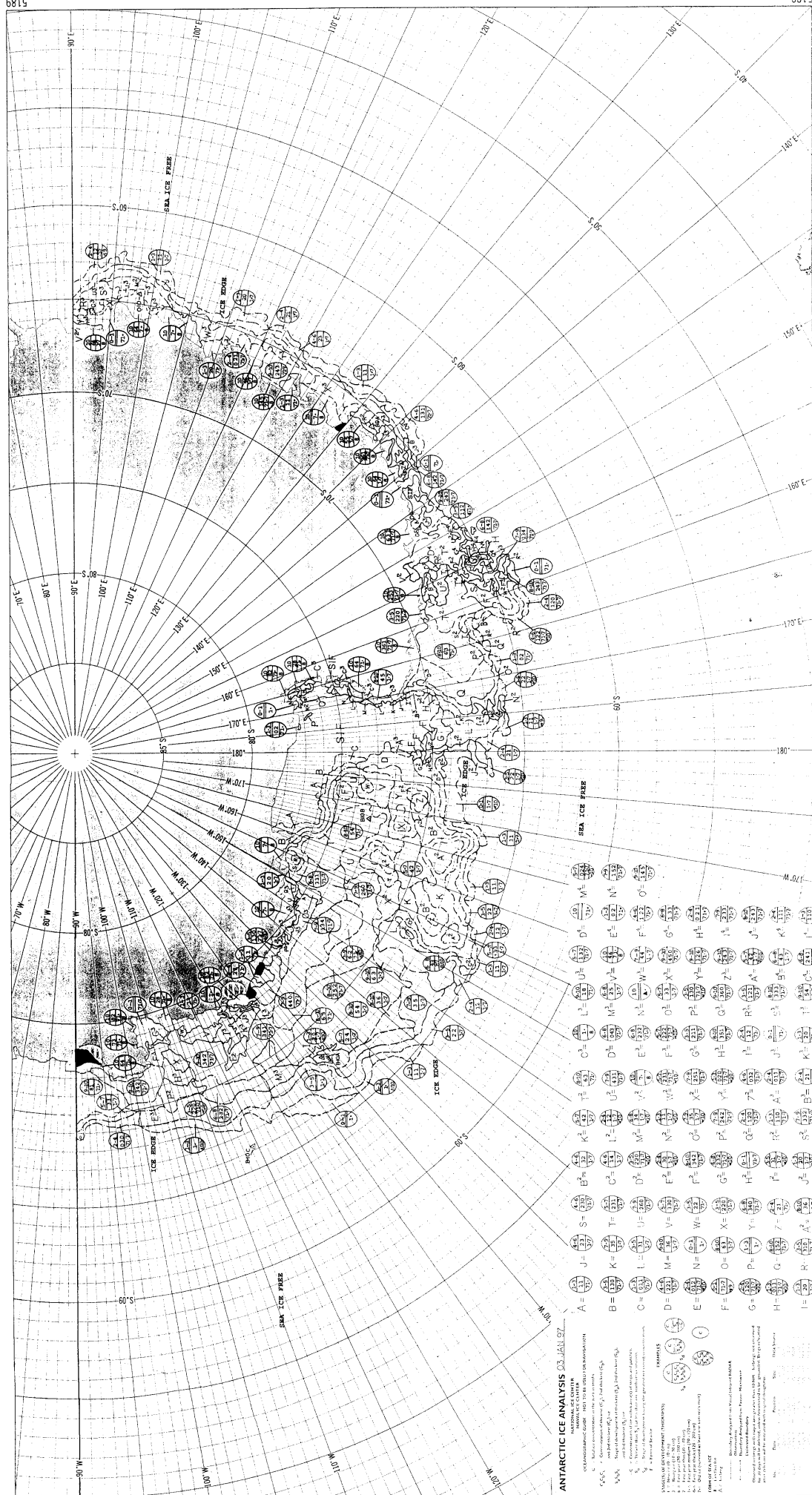
AVHRR- Advanced Very High Resolution Radiometer  
cm- centimeter  
GHz- GigaHertz  
HRPT- High Resolution Picture transmission  
IR- Infrared  
km- kilometer  
LAC- Local Area Coverage  
NIR- Near Infrared  
OLS- Operational Linescan System  
SSM/I- Special Sensor Microwave Imager  
 $\mu$ m- micrometer  
VIS- Visible

Antarctica satellite composite courtesy of United States Geological Survey, Flagstaff, AZ.  
(<http://TerraWeb.wr.usgs.gov/TRS/projects/Antarctica/color/images>).

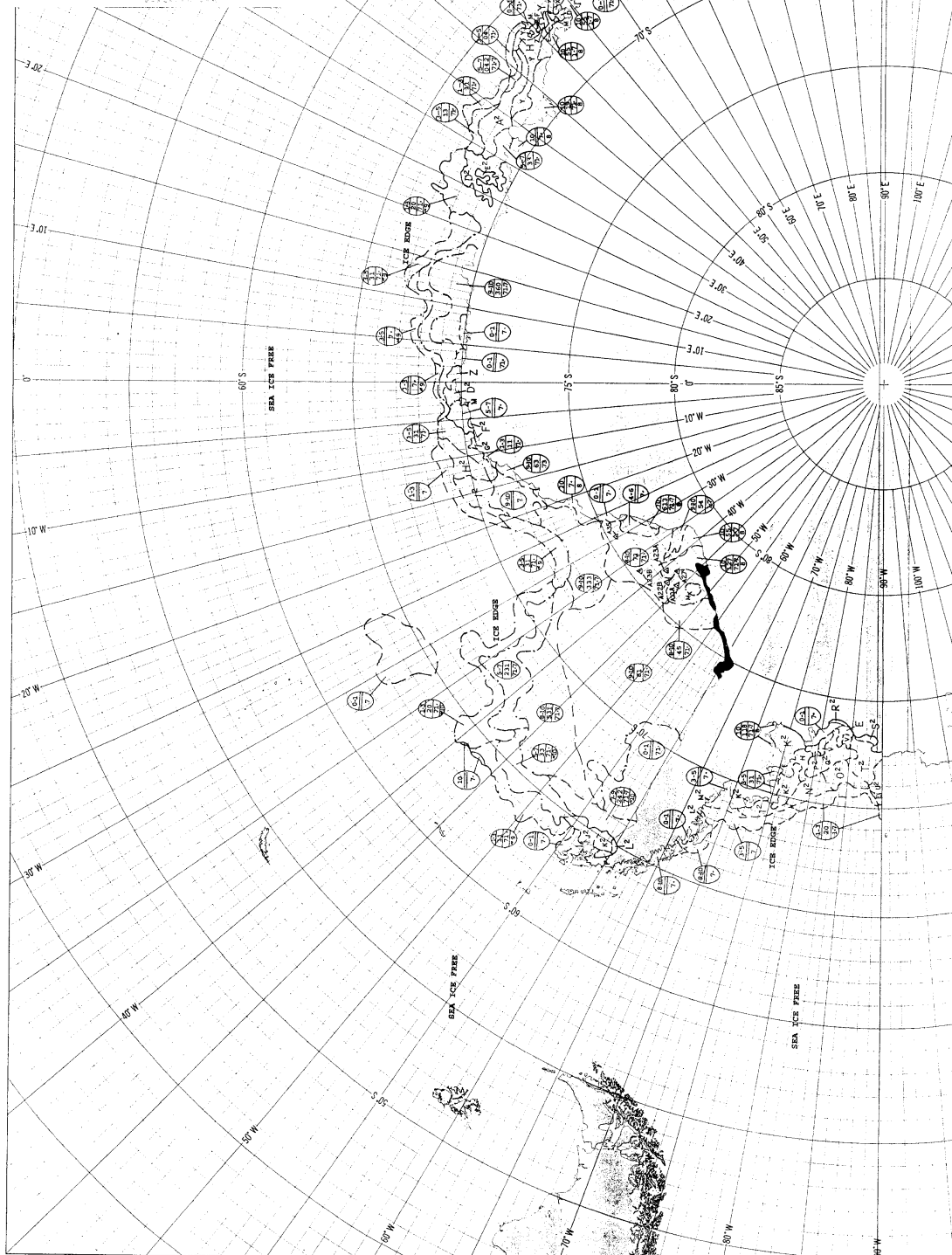
Prepared under the authority of Commander, Naval Oceanography Command, Stennis Space Center, MS 39529-5000



**ANTARCTIC ICE ANALYSIS**  
NATIONAL ICE SERVICE  
ICEBERG DATA - NOT TO BE USED FOR NAVIGATION  
C - Iceberg information for the area covered by this chart  
S - Iceberg information for the area covered by this chart  
N - Iceberg information for the area covered by this chart  
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# ANTARCTIC ICE ANALYSIS

10-11-17

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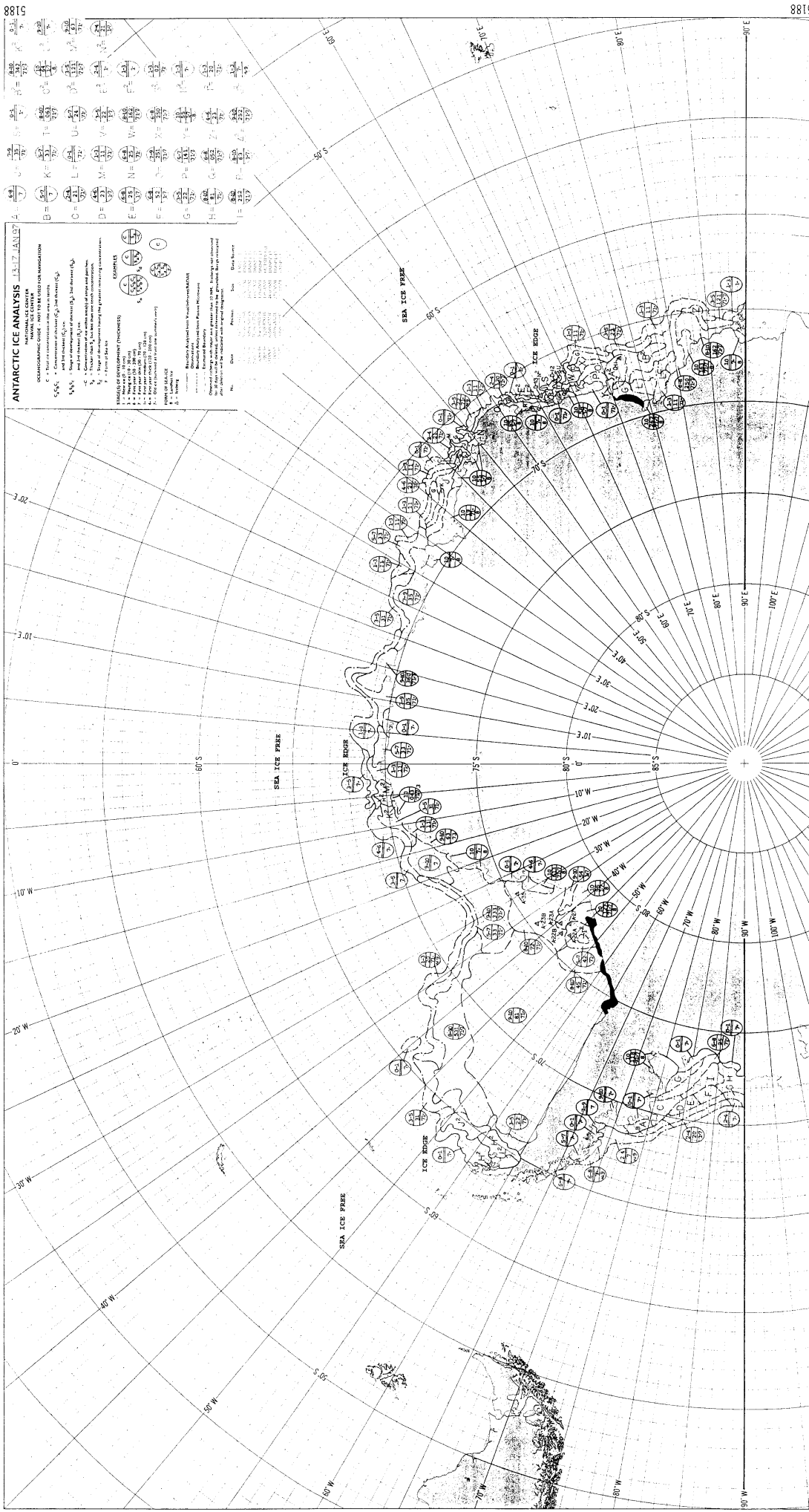
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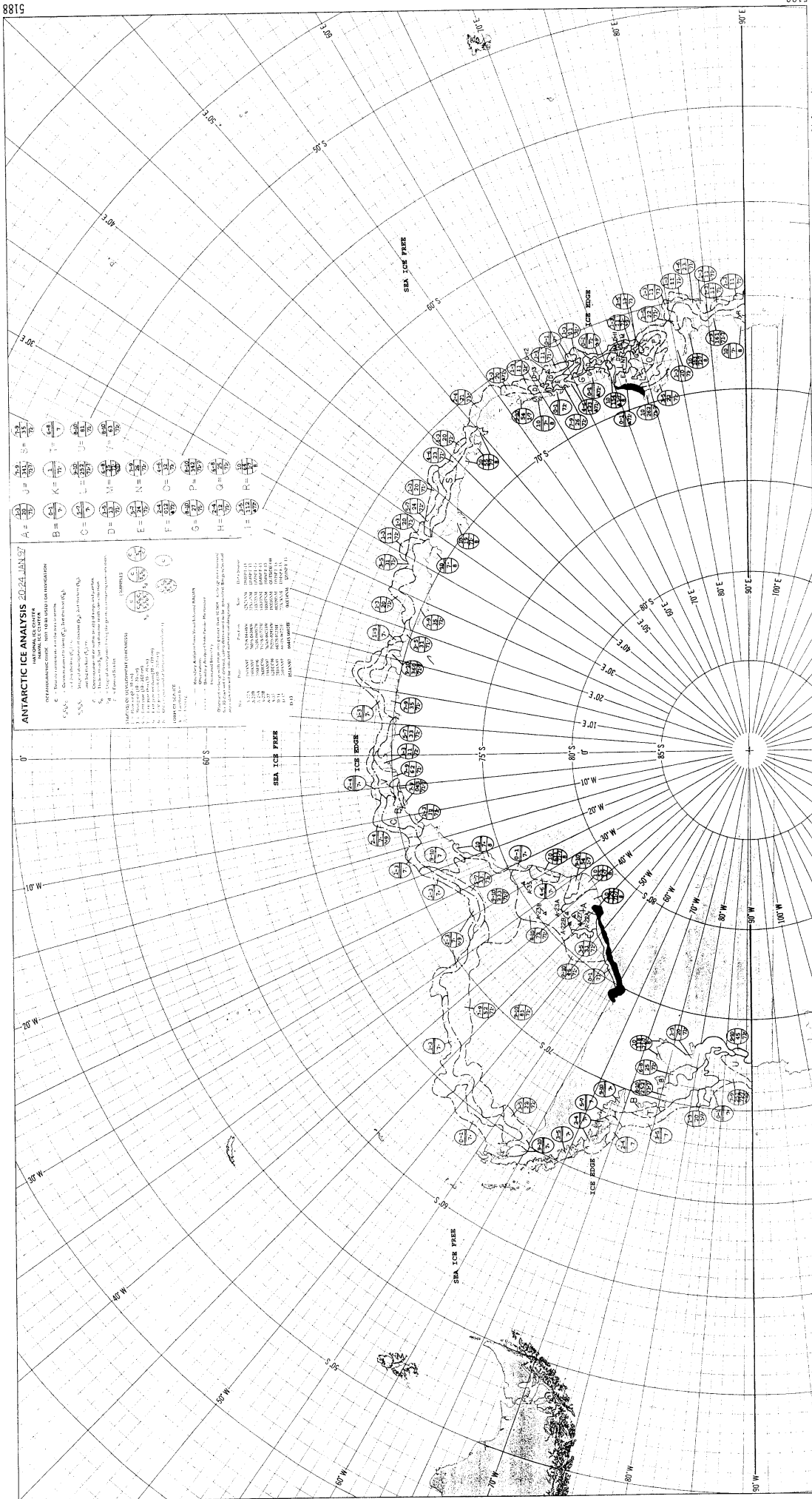
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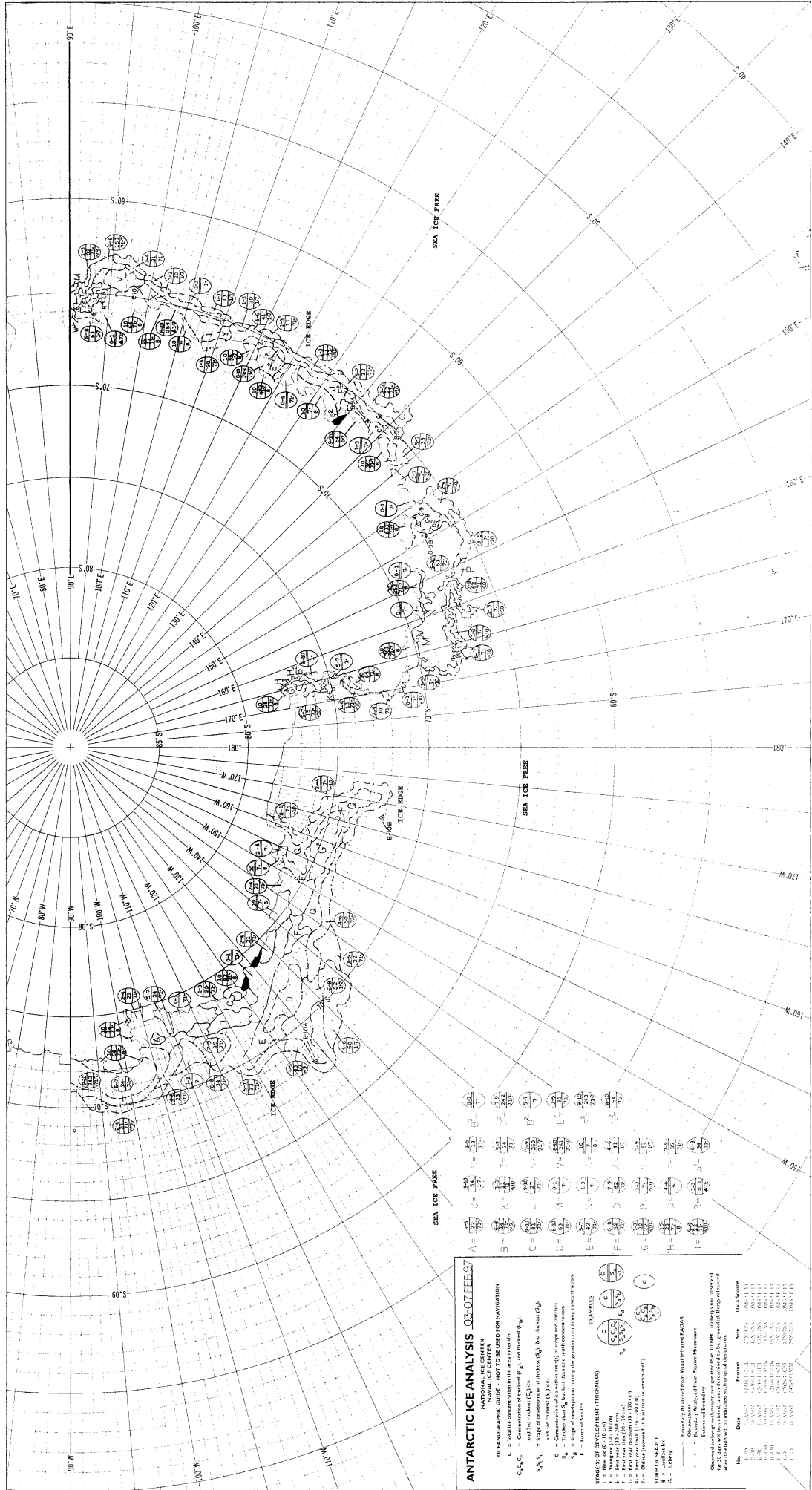












# ANTARCTIC ICE ANALYSIS 03-07 FEB 97

NAVY ICE CENTER  
NAVAL ICE CENTER

OCEANOGRAPHIC GUIDE - NOT TO BE USED FOR NAVIGATION

C = Ice concentration in the area in tenths

$C_1, C_2, C_3$  = Concentration of ice in the first, second, and third thicknesses ( $C_1, C_2, C_3$ )

$S_1, S_2, S_3$  = Stage of development of the first, second, and third thicknesses ( $S_1, S_2, S_3$ )

$C_1, C_2, C_3$  = Concentration of ice within each of the first, second, and third thicknesses

$S_1, S_2, S_3$  = Stage of development of the first, second, and third thicknesses

$P$  = Form of ice

$H$  = Form of ice

$L$  = New ice (0-10 km)

$R$  = First year (10-100 km)

$S$  = First year (100-200 km)

$T$  = First year (200-300 km)

$U$  = First year (300-400 km)

$V$  = First year (400-500 km)

$W$  = First year (500-600 km)

$X$  = First year (600-700 km)

$Y$  = First year (700-800 km)

$Z$  = First year (800-900 km)

$A$  = First year (900-1000 km)

$B$  = First year (1000-1100 km)

$C$  = First year (1100-1200 km)

$D$  = First year (1200-1300 km)

$E$  = First year (1300-1400 km)

$F$  = First year (1400-1500 km)

$G$  = First year (1500-1600 km)

$H$  = First year (1600-1700 km)

$I$  = First year (1700-1800 km)

$J$  = First year (1800-1900 km)

$K$  = First year (1900-2000 km)

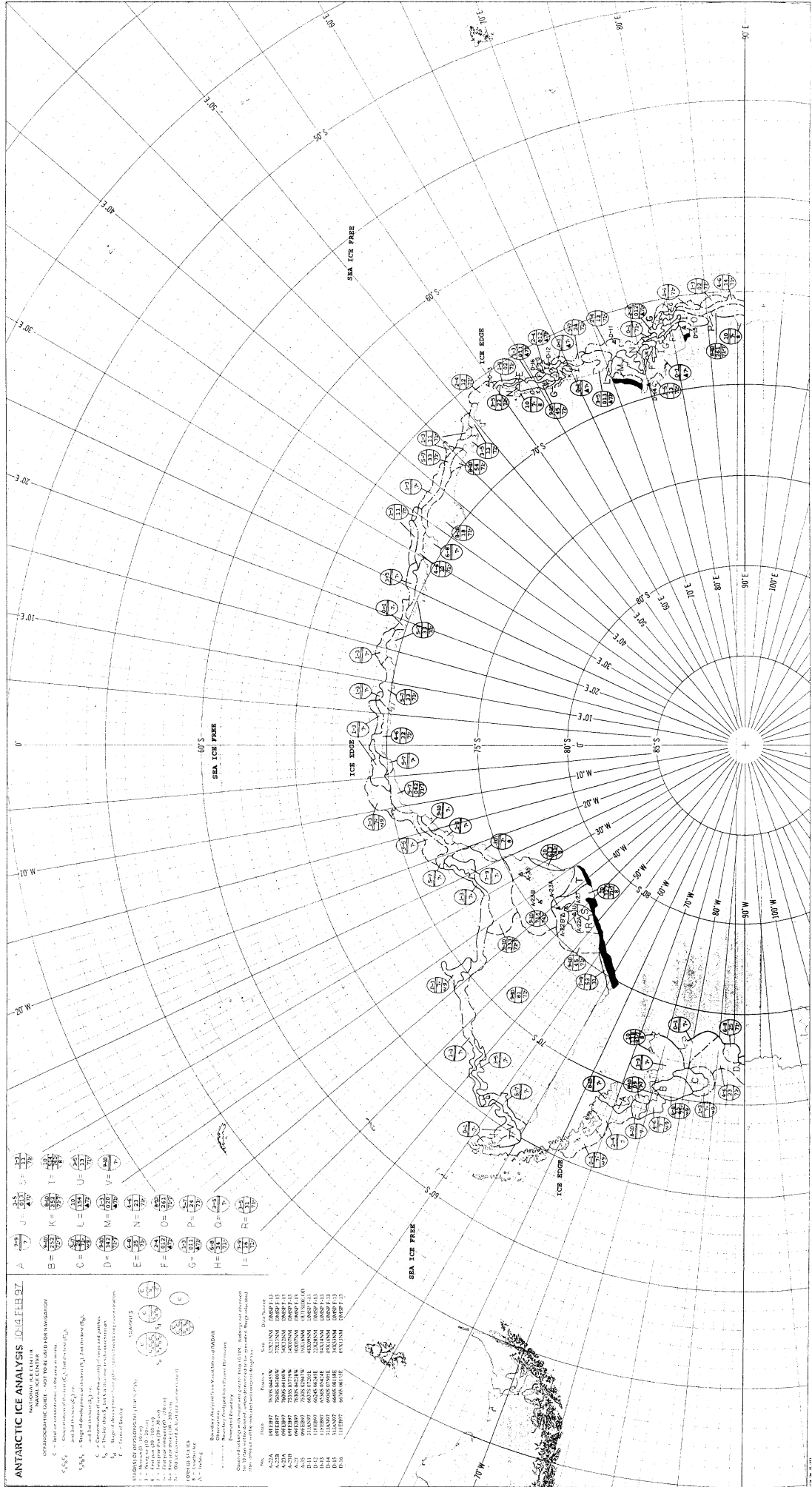
$L$  = First year (2000-2100 km)

$M$  = First year (2100-2200 km)

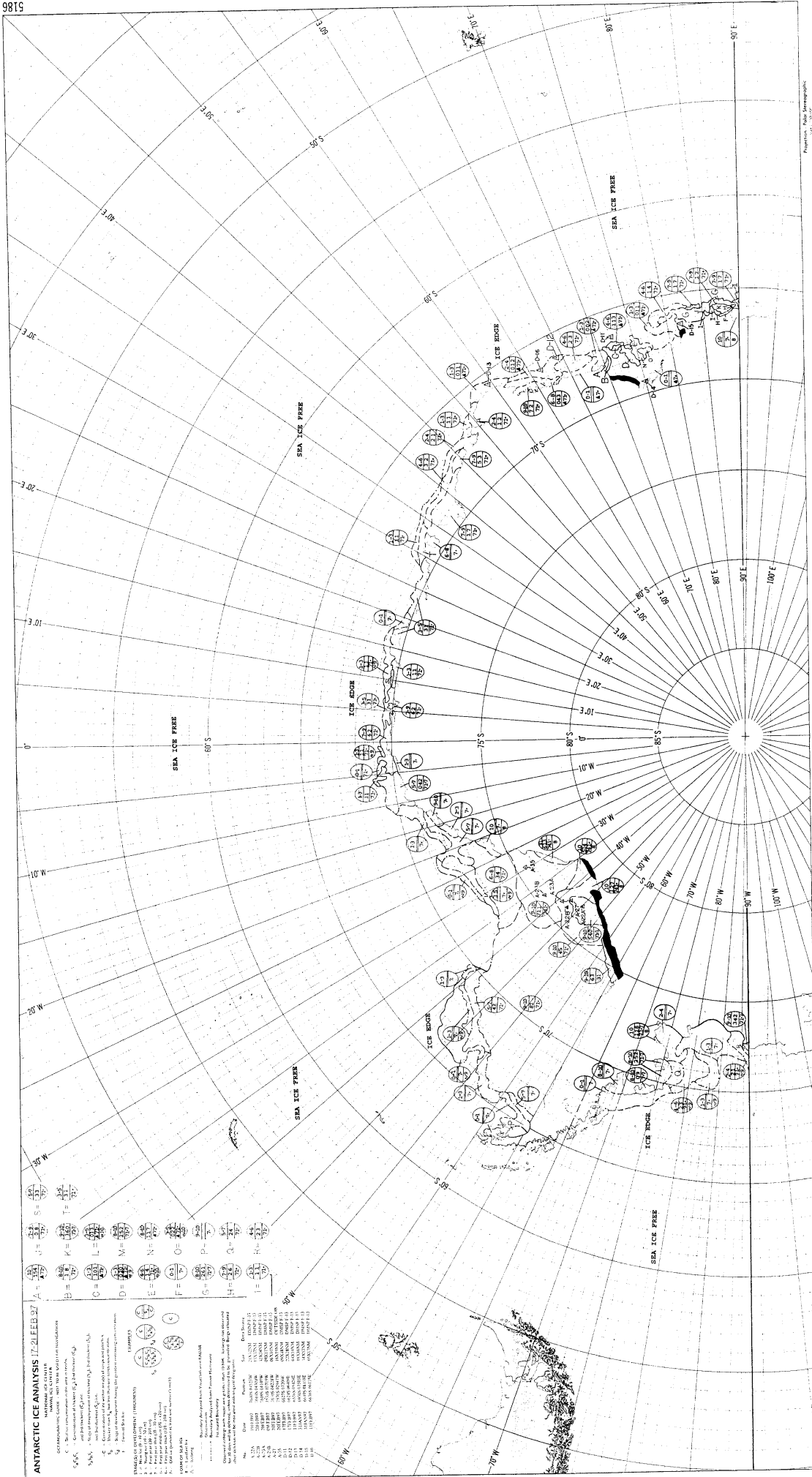
$N$  = First year (2200-2300 km)

$O$  = First year (2300-2400 km)

$P$  = First year (2400-2500 km)







**ANTARCTIC ICE ANALYSIS 1721 FEB 97**

**MAINTAINING ICE STATUS**

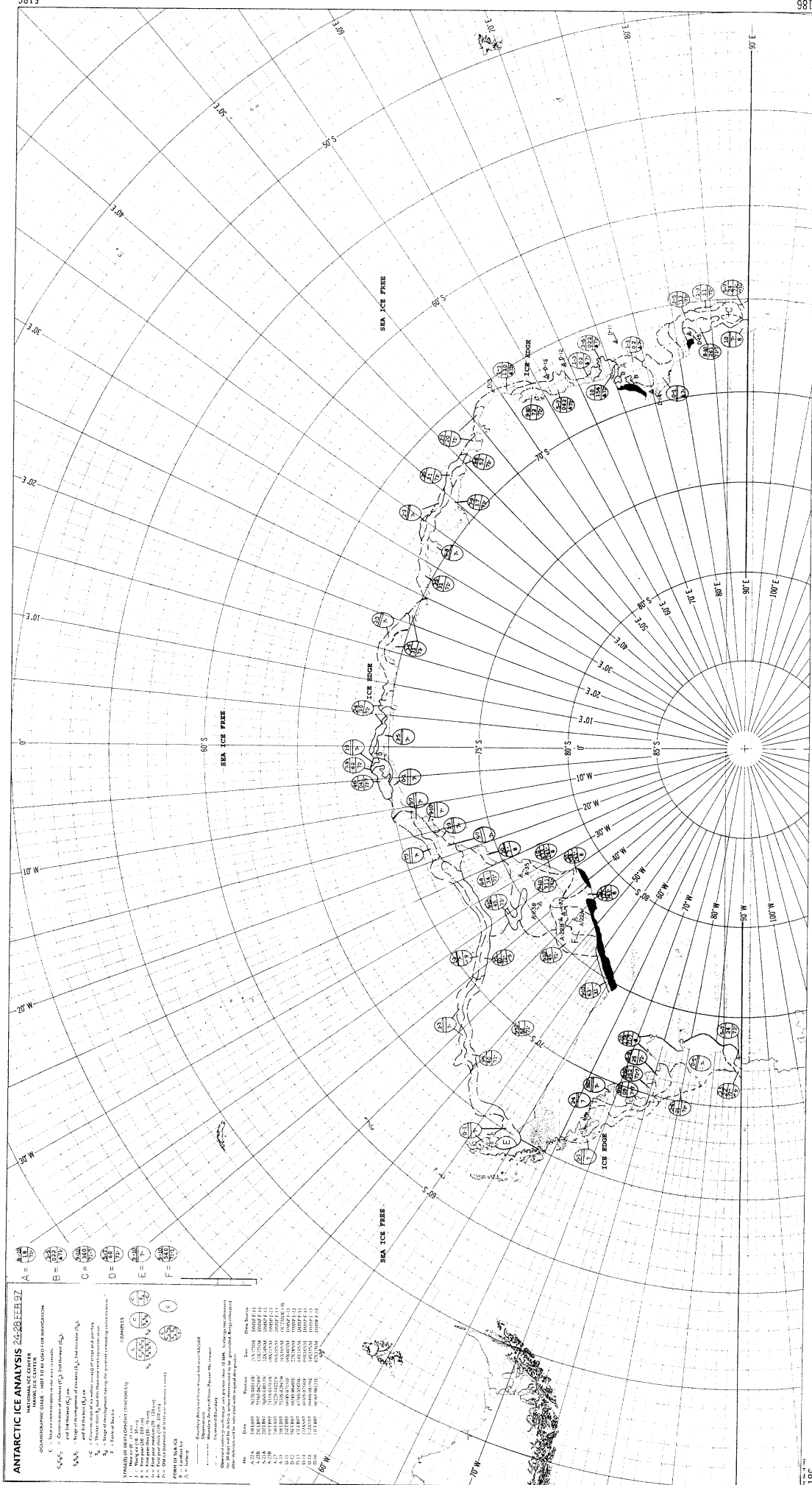
**DEFINITIONS:**

- A** - Icebergs (including icebergs and icebergs)
- B** - Icebergs (including icebergs and icebergs)
- C** - Icebergs (including icebergs and icebergs)
- D** - Icebergs (including icebergs and icebergs)
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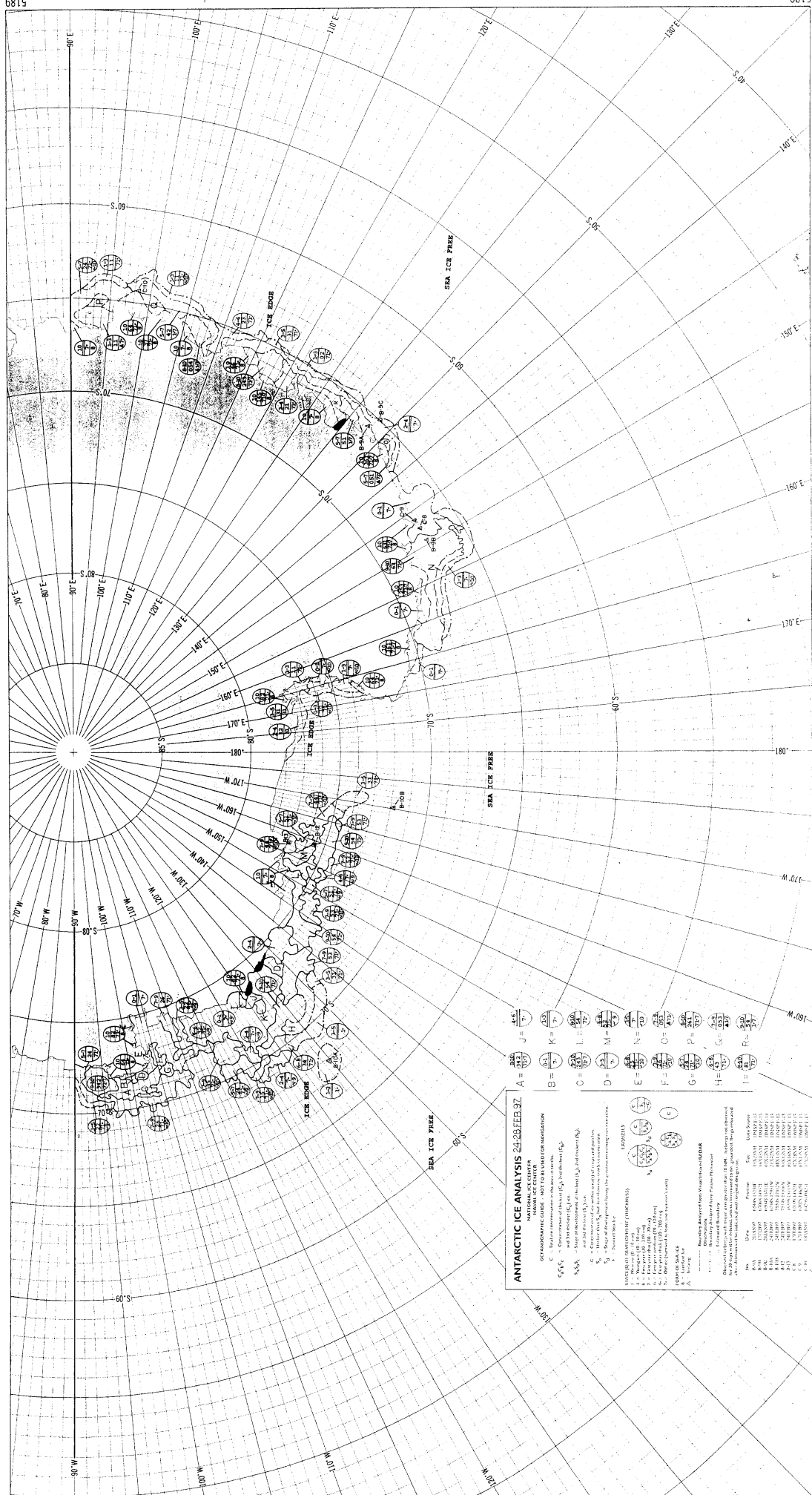
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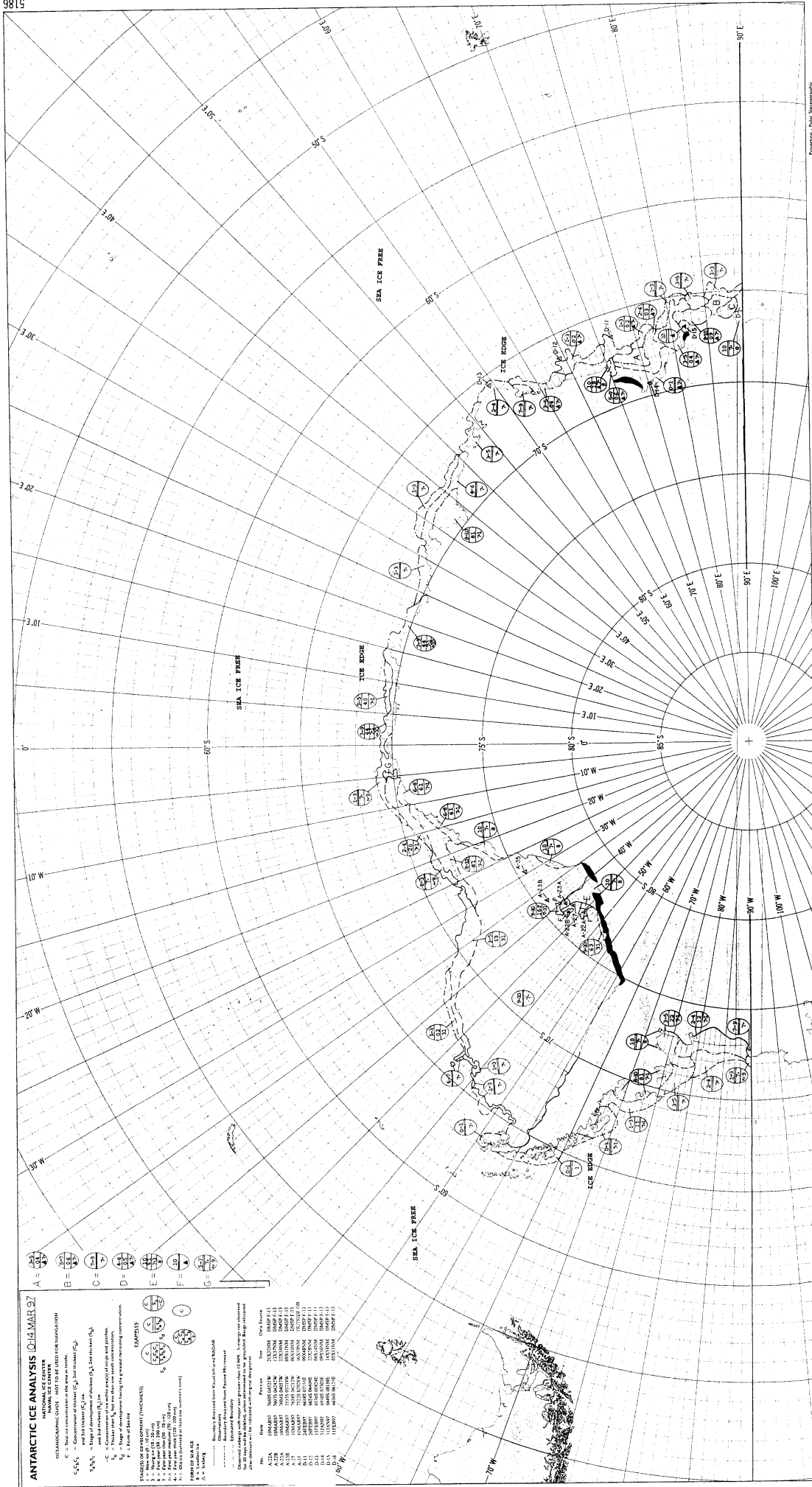
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Projections: Polar Stereographic  
Scale: 1:50,000

Source: National Ice Center  
Date: 14 MAR 97

# ANTARCTIC ICE ANALYSIS 10:14 MAR 97

NATIONAL ICE CENTER  
CENTRO NACIONAL DE INFORMACIÓN DE LA NEVADA

C = Sea ice concentration in the area in %.

$C_{max}$  = Concentration of thickest ice and thickness  $H_{max}$ .

$C_{min}$  = Concentration of thinnest ice and thickness  $H_{min}$ .

$C_{avg}$  = Average concentration of ice and thickness  $H_{avg}$ .

$C_{ice}$  = Thickness of ice in the area in %.

$H_{ice}$  = Thickness of ice in the area in %.

$H_{max}$  = Thickness of thickest ice in the area in %.

$H_{min}$  = Thickness of thinnest ice in the area in %.

$H_{avg}$  = Average thickness of ice in the area in %.

$H_{ice}$  = Thickness of ice in the area in %.

$H_{max}$  = Thickness of thickest ice in the area in %.

$H_{min}$  = Thickness of thinnest ice in the area in %.

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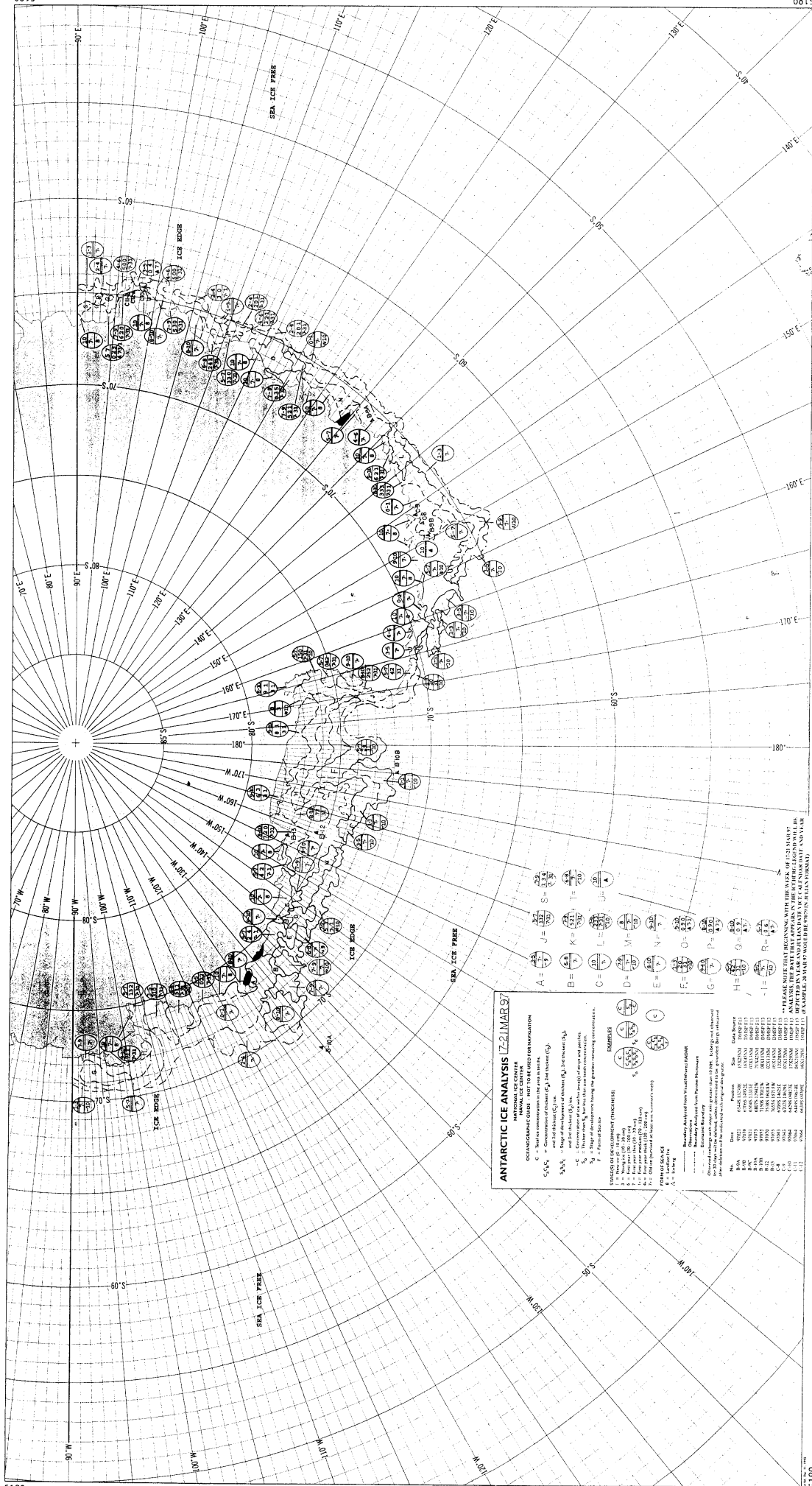
$H_{ice}$  = Thickness of ice in the area in %.

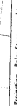
$H_{max}$  = Thickness of thickest ice in the area in %.

$H_{min}$  = Thickness of thinnest ice in the area in %.

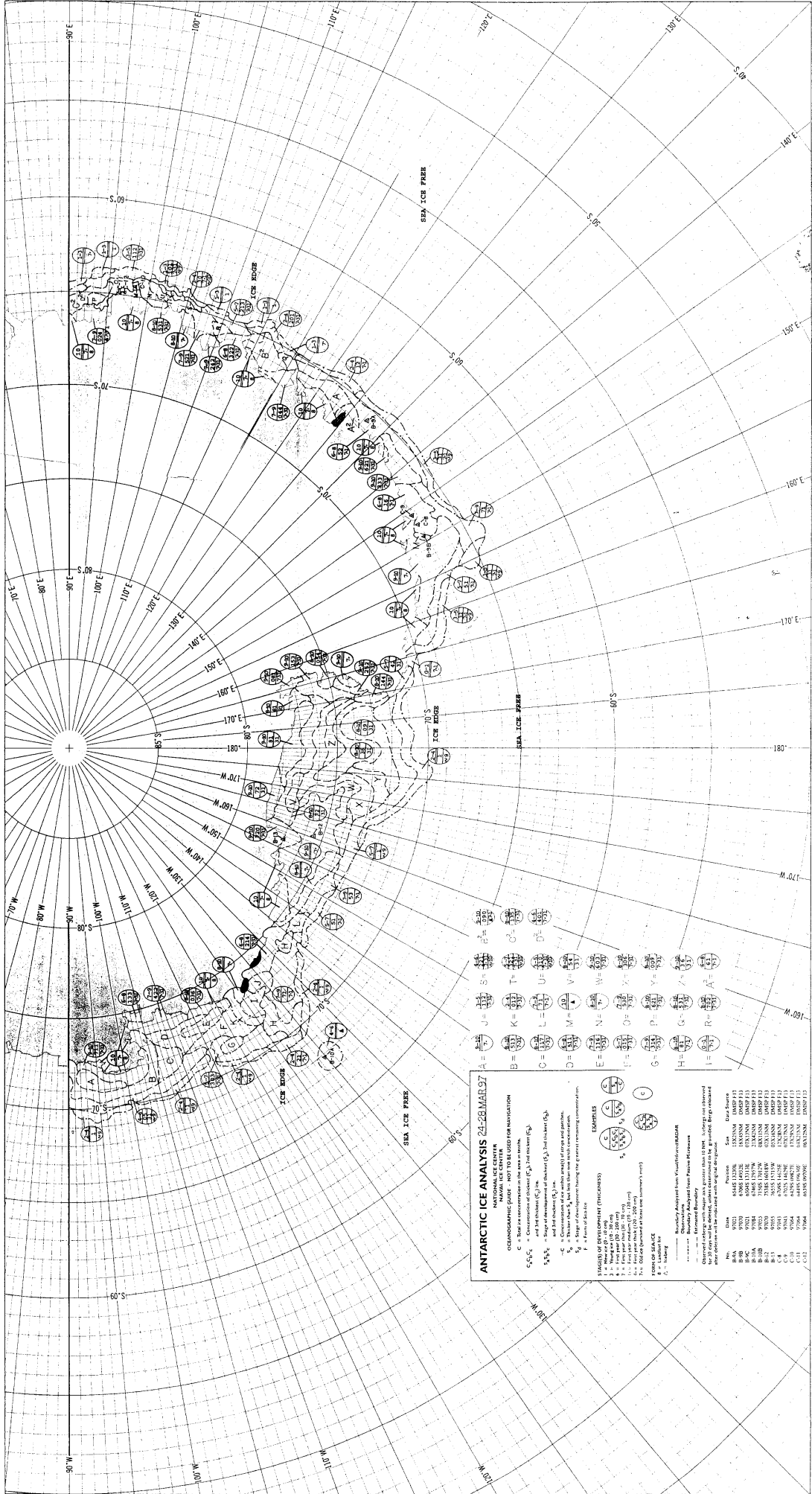




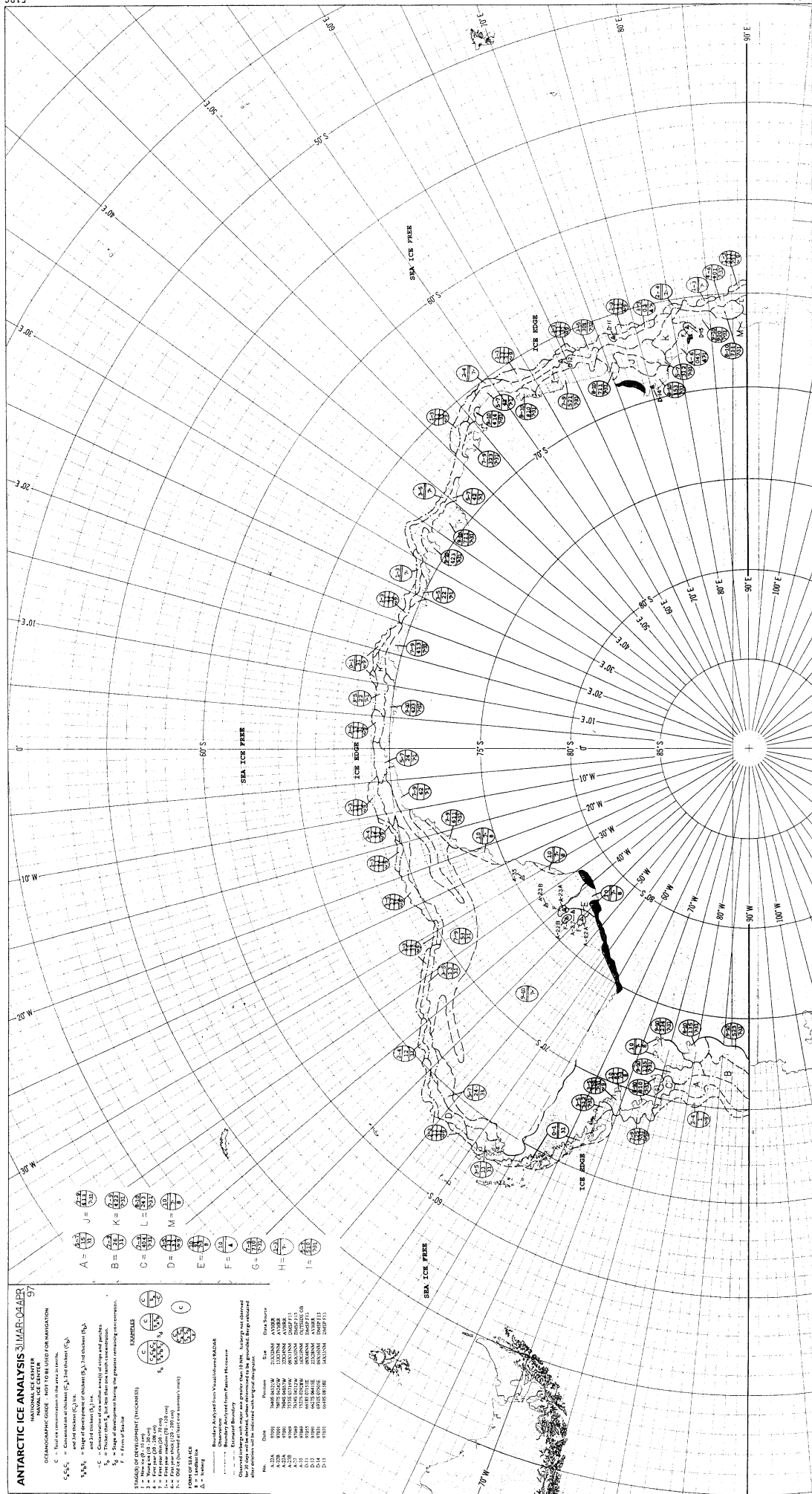












Projection: Polar Stereographic  
Datum: Antarctic 1960  
Scale: 1:10,000,000

Source: National Ice Center  
Date: 15 March 2004

# ANTARCTIC ICE ANALYSIS 15 MAR 2004

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NATIONAL ICE CENTER  
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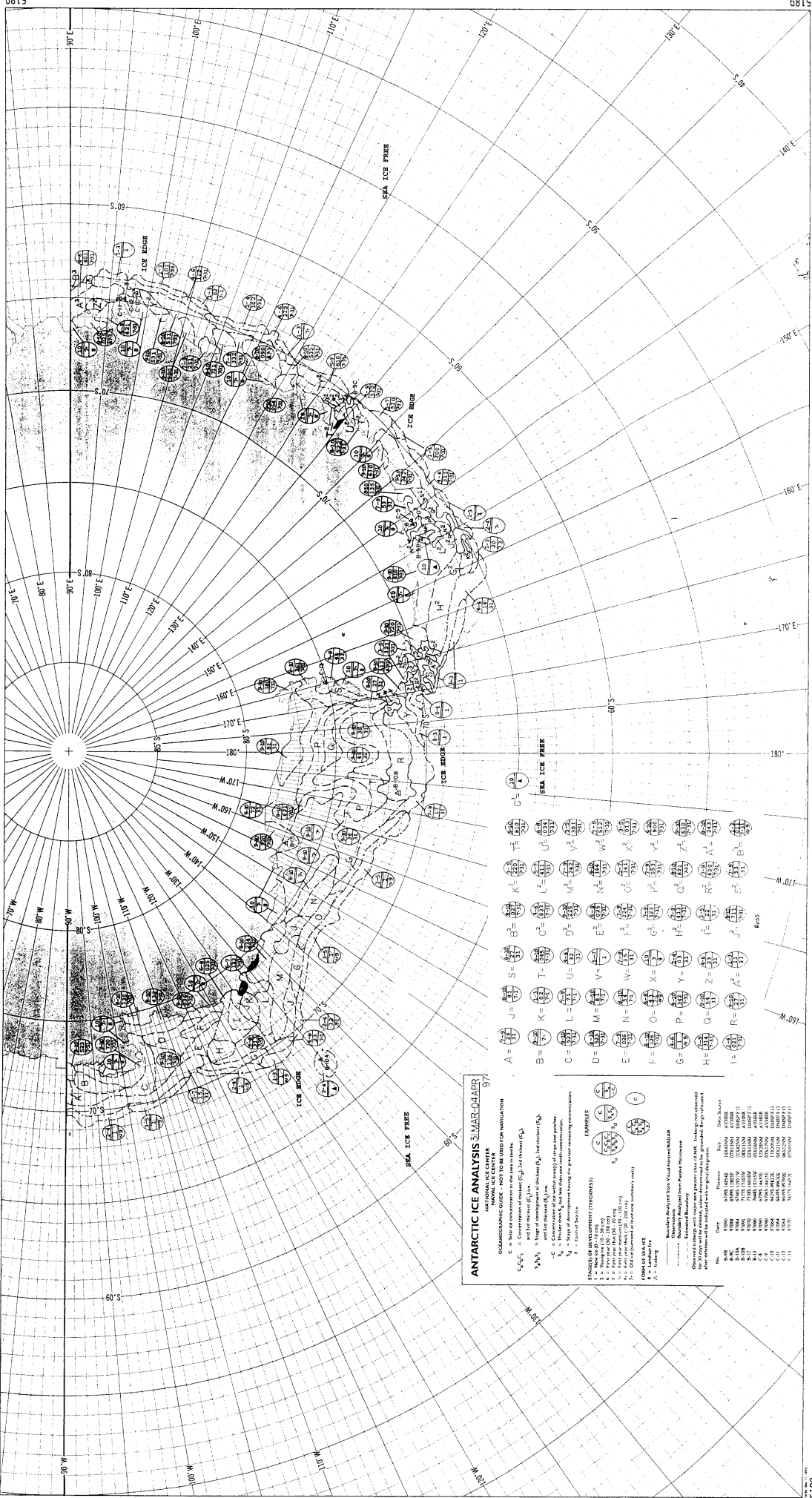
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NATIONAL ICE CENTER  
ICE INFORMATION FOR NAVIGATION

ICONS AND SYMBOLS FOR NAVIGATION  
C = Concentration of ice (C<sub>1</sub>, C<sub>2</sub>, C<sub>3</sub>) in the area  
S = Sea ice  
T = Thickness of ice (T<sub>1</sub>, T<sub>2</sub>, T<sub>3</sub>) in the area  
L = Lead (L<sub>1</sub>, L<sub>2</sub>, L<sub>3</sub>) in the area  
M = Maximum ice extent (M<sub>1</sub>, M<sub>2</sub>, M<sub>3</sub>) in the area  
N = Number of icebergs (N<sub>1</sub>, N<sub>2</sub>, N<sub>3</sub>) in the area  
O = Other (O<sub>1</sub>, O<sub>2</sub>, O<sub>3</sub>) in the area  
P = Position (P<sub>1</sub>, P<sub>2</sub>, P<sub>3</sub>) in the area  
Q = Quantity (Q<sub>1</sub>, Q<sub>2</sub>, Q<sub>3</sub>) in the area  
R = Range (R<sub>1</sub>, R<sub>2</sub>, R<sub>3</sub>) in the area  
S = Size (S<sub>1</sub>, S<sub>2</sub>, S<sub>3</sub>) in the area  
T = Time (T<sub>1</sub>, T<sub>2</sub>, T<sub>3</sub>) in the area  
U = Unit (U<sub>1</sub>, U<sub>2</sub>, U<sub>3</sub>) in the area  
V = Value (V<sub>1</sub>, V<sub>2</sub>, V<sub>3</sub>) in the area  
W = Weight (W<sub>1</sub>, W<sub>2</sub>, W<sub>3</sub>) in the area  
X = X-axis (X<sub>1</sub>, X<sub>2</sub>, X<sub>3</sub>) in the area  
Y = Y-axis (Y<sub>1</sub>, Y<sub>2</sub>, Y<sub>3</sub>) in the area  
Z = Z-axis (Z<sub>1</sub>, Z<sub>2</sub>, Z<sub>3</sub>) in the area

EXAMPLES OF DEVELOPMENT (THICKNESS)  
1. Ice thickness (T<sub>1</sub>) in the area  
2. Ice thickness (T<sub>2</sub>) in the area  
3. Ice thickness (T<sub>3</sub>) in the area  
4. Ice thickness (T<sub>4</sub>) in the area  
5. Ice thickness (T<sub>5</sub>) in the area  
6. Ice thickness (T<sub>6</sub>) in the area  
7. Ice thickness (T<sub>7</sub>) in the area  
8. Ice thickness (T<sub>8</sub>) in the area  
9. Ice thickness (T<sub>9</sub>) in the area  
10. Ice thickness (T<sub>10</sub>) in the area

EXAMPLES OF DEVELOPMENT (CONCENTRATION)  
1. Ice concentration (C<sub>1</sub>) in the area  
2. Ice concentration (C<sub>2</sub>) in the area  
3. Ice concentration (C<sub>3</sub>) in the area  
4. Ice concentration (C<sub>4</sub>) in the area  
5. Ice concentration (C<sub>5</sub>) in the area  
6. Ice concentration (C<sub>6</sub>) in the area  
7. Ice concentration (C<sub>7</sub>) in the area  
8. Ice concentration (C<sub>8</sub>) in the area  
9. Ice concentration (C<sub>9</sub>) in the area  
10. Ice concentration (C<sub>10</sub>) in the area

EXAMPLES OF DEVELOPMENT (LEAD)  
1. Ice lead (L<sub>1</sub>) in the area  
2. Ice lead (L<sub>2</sub>) in the area  
3. Ice lead (L<sub>3</sub>) in the area  
4. Ice lead (L<sub>4</sub>) in the area  
5. Ice lead (L<sub>5</sub>) in the area  
6. Ice lead (L<sub>6</sub>) in the area  
7. Ice lead (L<sub>7</sub>) in the area  
8. Ice lead (L<sub>8</sub>) in the area  
9. Ice lead (L<sub>9</sub>) in the area  
10. Ice lead (L<sub>10</sub>) in the area

EXAMPLES OF DEVELOPMENT (MAXIMUM ICE EXTENT)  
1. Maximum ice extent (M<sub>1</sub>) in the area  
2. Maximum ice extent (M<sub>2</sub>) in the area  
3. Maximum ice extent (M<sub>3</sub>) in the area  
4. Maximum ice extent (M<sub>4</sub>) in the area  
5. Maximum ice extent (M<sub>5</sub>) in the area  
6. Maximum ice extent (M<sub>6</sub>) in the area  
7. Maximum ice extent (M<sub>7</sub>) in the area  
8. Maximum ice extent (M<sub>8</sub>) in the area  
9. Maximum ice extent (M<sub>9</sub>) in the area  
10. Maximum ice extent (M<sub>10</sub>) in the area

EXAMPLES OF DEVELOPMENT (NUMBER OF ICEBERGS)  
1. Number of icebergs (N<sub>1</sub>) in the area  
2. Number of icebergs (N<sub>2</sub>) in the area  
3. Number of icebergs (N<sub>3</sub>) in the area  
4. Number of icebergs (N<sub>4</sub>) in the area  
5. Number of icebergs (N<sub>5</sub>) in the area  
6. Number of icebergs (N<sub>6</sub>) in the area  
7. Number of icebergs (N<sub>7</sub>) in the area  
8. Number of icebergs (N<sub>8</sub>) in the area  
9. Number of icebergs (N<sub>9</sub>) in the area  
10. Number of icebergs (N<sub>10</sub>) in the area

EXAMPLES OF DEVELOPMENT (OTHER)  
1. Other (O<sub>1</sub>) in the area  
2. Other (O<sub>2</sub>) in the area  
3. Other (O<sub>3</sub>) in the area  
4. Other (O<sub>4</sub>) in the area  
5. Other (O<sub>5</sub>) in the area  
6. Other (O<sub>6</sub>) in the area  
7. Other (O<sub>7</sub>) in the area  
8. Other (O<sub>8</sub>) in the area  
9. Other (O<sub>9</sub>) in the area  
10. Other (O<sub>10</sub>) in the area

EXAMPLES OF DEVELOPMENT (POSITION)  
1. Position (P<sub>1</sub>) in the area  
2. Position (P<sub>2</sub>) in the area  
3. Position (P<sub>3</sub>) in the area  
4. Position (P<sub>4</sub>) in the area  
5. Position (P<sub>5</sub>) in the area  
6. Position (P<sub>6</sub>) in the area  
7. Position (P<sub>7</sub>) in the area  
8. Position (P<sub>8</sub>) in the area  
9. Position (P<sub>9</sub>) in the area  
10. Position (P<sub>10</sub>) in the area

EXAMPLES OF DEVELOPMENT (QUANTITY)  
1. Quantity (Q<sub>1</sub>) in the area  
2. Quantity (Q<sub>2</sub>) in the area  
3. Quantity (Q<sub>3</sub>) in the area  
4. Quantity (Q<sub>4</sub>) in the area  
5. Quantity (Q<sub>5</sub>) in the area  
6. Quantity (Q<sub>6</sub>) in the area  
7. Quantity (Q<sub>7</sub>) in the area  
8. Quantity (Q<sub>8</sub>) in the area  
9. Quantity (Q<sub>9</sub>) in the area  
10. Quantity (Q<sub>10</sub>) in the area

EXAMPLES OF DEVELOPMENT (RANGE)  
1. Range (R<sub>1</sub>) in the area  
2. Range (R<sub>2</sub>) in the area  
3. Range (R<sub>3</sub>) in the area  
4. Range (R<sub>4</sub>) in the area  
5. Range (R<sub>5</sub>) in the area  
6. Range (R<sub>6</sub>) in the area  
7. Range (R<sub>7</sub>) in the area  
8. Range (R<sub>8</sub>) in the area  
9. Range (R<sub>9</sub>) in the area  
10. Range (R<sub>10</sub>) in the area

EXAMPLES OF DEVELOPMENT (SIZE)  
1. Size (S<sub>1</sub>) in the area  
2. Size (S<sub>2</sub>) in the area  
3. Size (S<sub>3</sub>) in the area  
4. Size (S<sub>4</sub>) in the area  
5. Size (S<sub>5</sub>) in the area  
6. Size (S<sub>6</sub>) in the area  
7. Size (S<sub>7</sub>) in the area  
8. Size (S<sub>8</sub>) in the area  
9. Size (S<sub>9</sub>) in the area  
10. Size (S<sub>10</sub>) in the area

EXAMPLES OF DEVELOPMENT (TIME)  
1. Time (T<sub>1</sub>) in the area  
2. Time (T<sub>2</sub>) in the area  
3. Time (T<sub>3</sub>) in the area  
4. Time (T<sub>4</sub>) in the area  
5. Time (T<sub>5</sub>) in the area  
6. Time (T<sub>6</sub>) in the area  
7. Time (T<sub>7</sub>) in the area  
8. Time (T<sub>8</sub>) in the area  
9. Time (T<sub>9</sub>) in the area  
10. Time (T<sub>10</sub>) in the area

EXAMPLES OF DEVELOPMENT (UNIT)  
1. Unit (U<sub>1</sub>) in the area  
2. Unit (U<sub>2</sub>) in the area  
3. Unit (U<sub>3</sub>) in the area  
4. Unit (U<sub>4</sub>) in the area  
5. Unit (U<sub>5</sub>) in the area  
6. Unit (U<sub>6</sub>) in the area  
7. Unit (U<sub>7</sub>) in the area  
8. Unit (U<sub>8</sub>) in the area  
9. Unit (U<sub>9</sub>) in the area  
10. Unit (U<sub>10</sub>) in the area

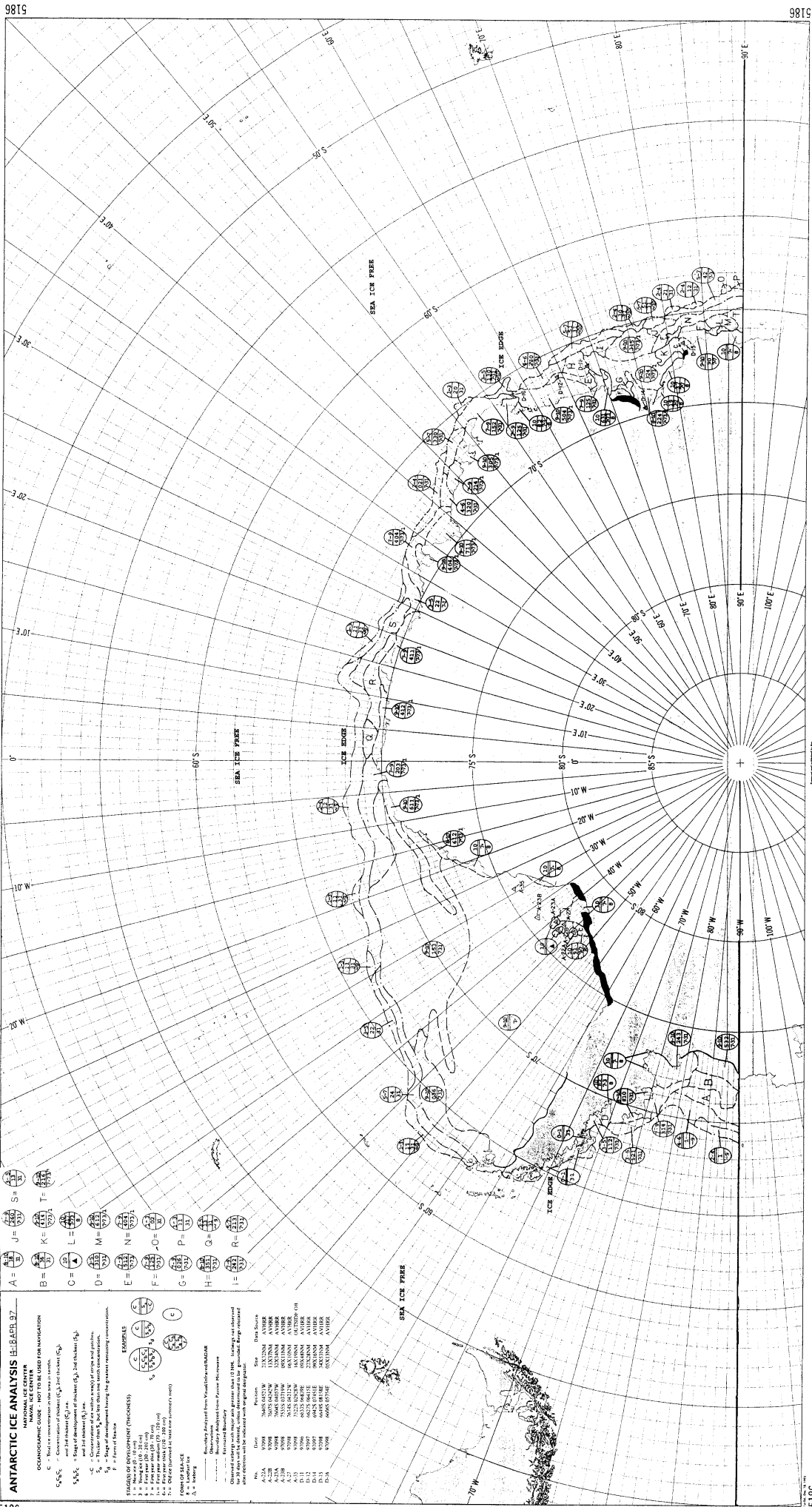
EXAMPLES OF DEVELOPMENT (VALUE)  
1. Value (V<sub>1</sub>) in the area  
2. Value (V<sub>2</sub>) in the area  
3. Value (V<sub>3</sub>) in the area  
4. Value (V<sub>4</sub>) in the area  
5. Value (V<sub>5</sub>) in the area  
6. Value (V<sub>6</sub>) in the area  
7. Value (V<sub>7</sub>) in the area  
8. Value (V<sub>8</sub>) in the area  
9. Value (V<sub>9</sub>) in the area  
10. Value (V<sub>10</sub>) in the area

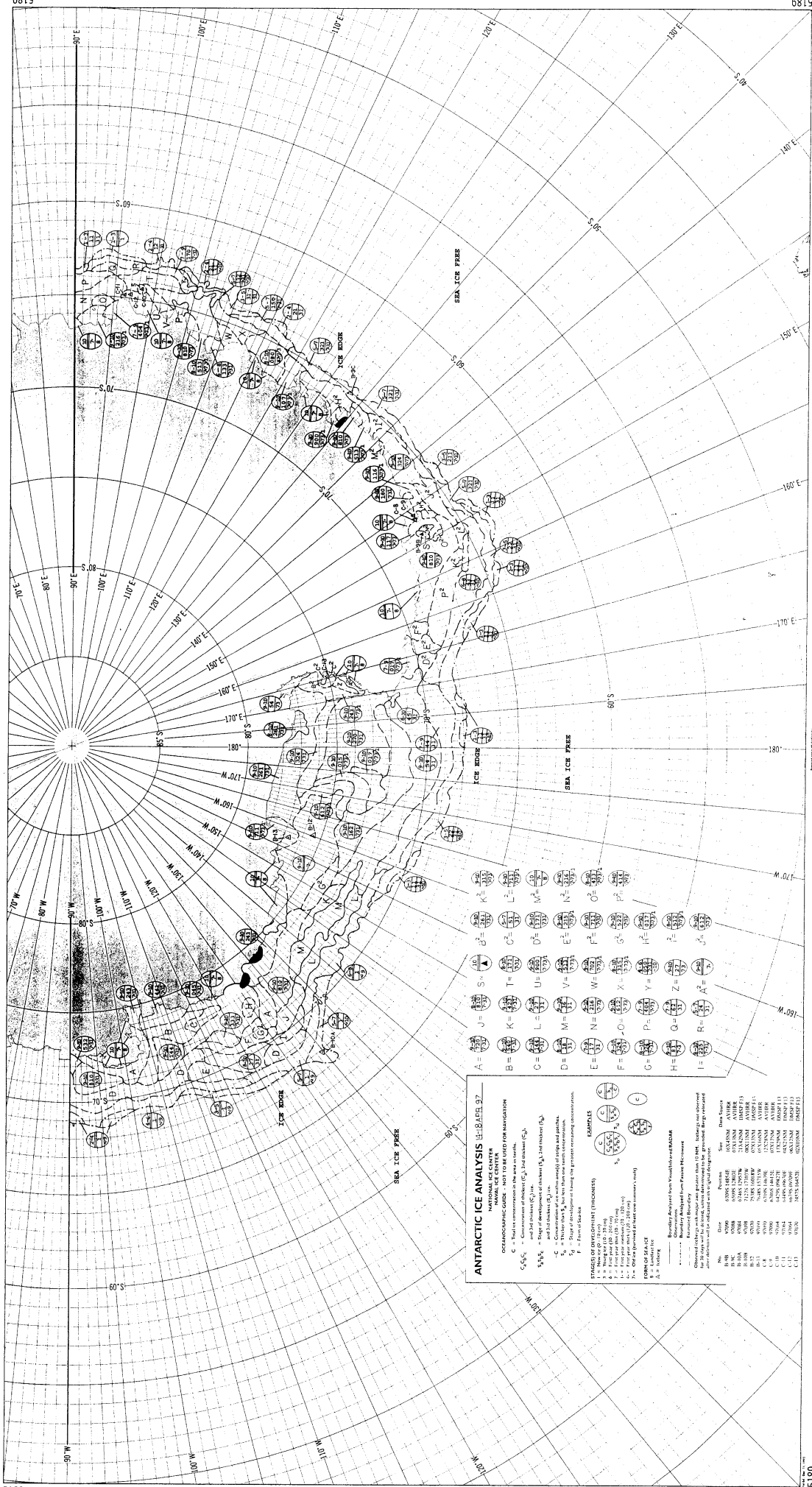
EXAMPLES OF DEVELOPMENT (WEIGHT)  
1. Weight (W<sub>1</sub>) in the area  
2. Weight (W<sub>2</sub>) in the area  
3. Weight (W<sub>3</sub>) in the area  
4. Weight (W<sub>4</sub>) in the area  
5. Weight (W<sub>5</sub>) in the area  
6. Weight (W<sub>6</sub>) in the area  
7. Weight (W<sub>7</sub>) in the area  
8. Weight (W<sub>8</sub>) in the area  
9. Weight (W<sub>9</sub>) in the area  
10. Weight (W<sub>10</sub>) in the area

EXAMPLES OF DEVELOPMENT (X-AXIS)  
1. X-axis (X<sub>1</sub>) in the area  
2. X-axis (X<sub>2</sub>) in the area  
3. X-axis (X<sub>3</sub>) in the area  
4. X-axis (X<sub>4</sub>) in the area  
5. X-axis (X<sub>5</sub>) in the area  
6. X-axis (X<sub>6</sub>) in the area  
7. X-axis (X<sub>7</sub>) in the area  
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9. X-axis (X<sub>9</sub>) in the area  
10. X-axis (X<sub>10</sub>) in the area

EXAMPLES OF DEVELOPMENT (Y-AXIS)  
1. Y-axis (Y<sub>1</sub>) in the area  
2. Y-axis (Y<sub>2</sub>) in the area  
3. Y-axis (Y<sub>3</sub>) in the area  
4. Y-axis (Y<sub>4</sub>) in the area  
5. Y-axis (Y<sub>5</sub>) in the area  
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8. Y-axis (Y<sub>8</sub>) in the area  
9. Y-axis (Y<sub>9</sub>) in the area  
10. Y-axis (Y<sub>10</sub>) in the area

EXAMPLES OF DEVELOPMENT (Z-AXIS)  
1. Z-axis (Z<sub>1</sub>) in the area  
2. Z-axis (Z<sub>2</sub>) in the area  
3. Z-axis (Z<sub>3</sub>) in the area  
4. Z-axis (Z<sub>4</sub>) in the area  
5. Z-axis (Z<sub>5</sub>) in the area  
6. Z-axis (Z<sub>6</sub>) in the area  
7. Z-axis (Z<sub>7</sub>) in the area  
8. Z-axis (Z<sub>8</sub>) in the area  
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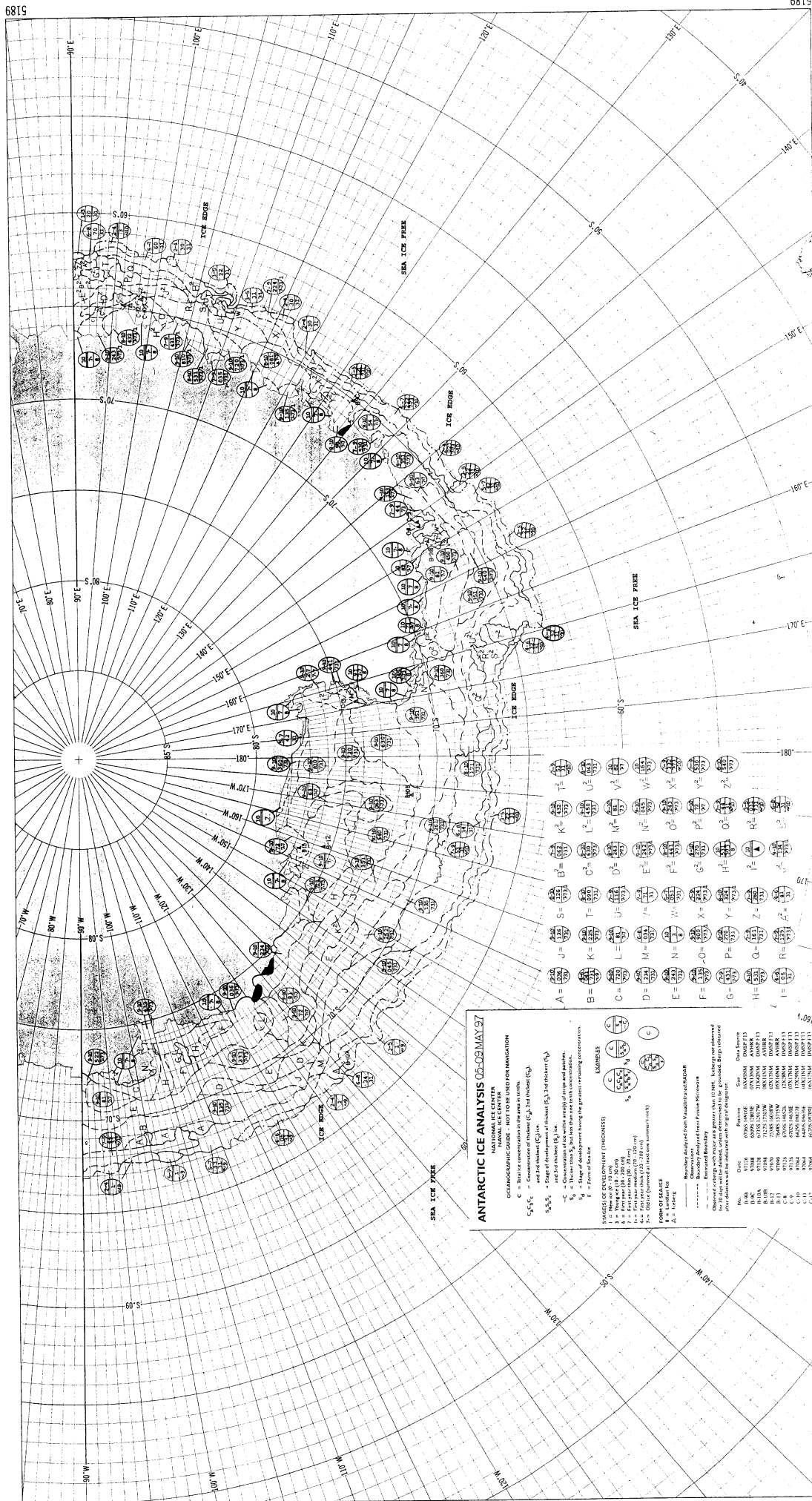












- A =  $\frac{100}{100}$  S =  $\frac{100}{100}$   
B =  $\frac{100}{100}$  T =  $\frac{100}{100}$   
C =  $\frac{100}{100}$  U =  $\frac{100}{100}$   
D =  $\frac{100}{100}$  V =  $\frac{100}{100}$   
E =  $\frac{100}{100}$  W =  $\frac{100}{100}$   
F =  $\frac{100}{100}$  X =  $\frac{100}{100}$   
G =  $\frac{100}{100}$  Y =  $\frac{100}{100}$   
H =  $\frac{100}{100}$  Z =  $\frac{100}{100}$   
I =  $\frac{100}{100}$

**SYMBOLS OF DEVELOPMENT (THICKNESS)**

1 = New Year (12-31 May)  
2 = First year (1-31 May)  
3 = Second year (1-31 Jun)  
4 = Third year (1-31 Jul)  
5 = Fourth year (1-31 Aug)  
6 = Fifth year (1-31 Sep)  
7 = Sixth year (1-31 Oct)  
8 = Seventh year (1-31 Nov)  
9 = Eighth year (1-31 Dec)

**EXAMPLES**

1.  $\frac{100}{100}$  (12-31 May)  
2.  $\frac{100}{100}$  (1-31 May)  
3.  $\frac{100}{100}$  (1-31 Jun)  
4.  $\frac{100}{100}$  (1-31 Jul)  
5.  $\frac{100}{100}$  (1-31 Aug)  
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**SYMBOLS OF DEVELOPMENT (THICKNESS)**

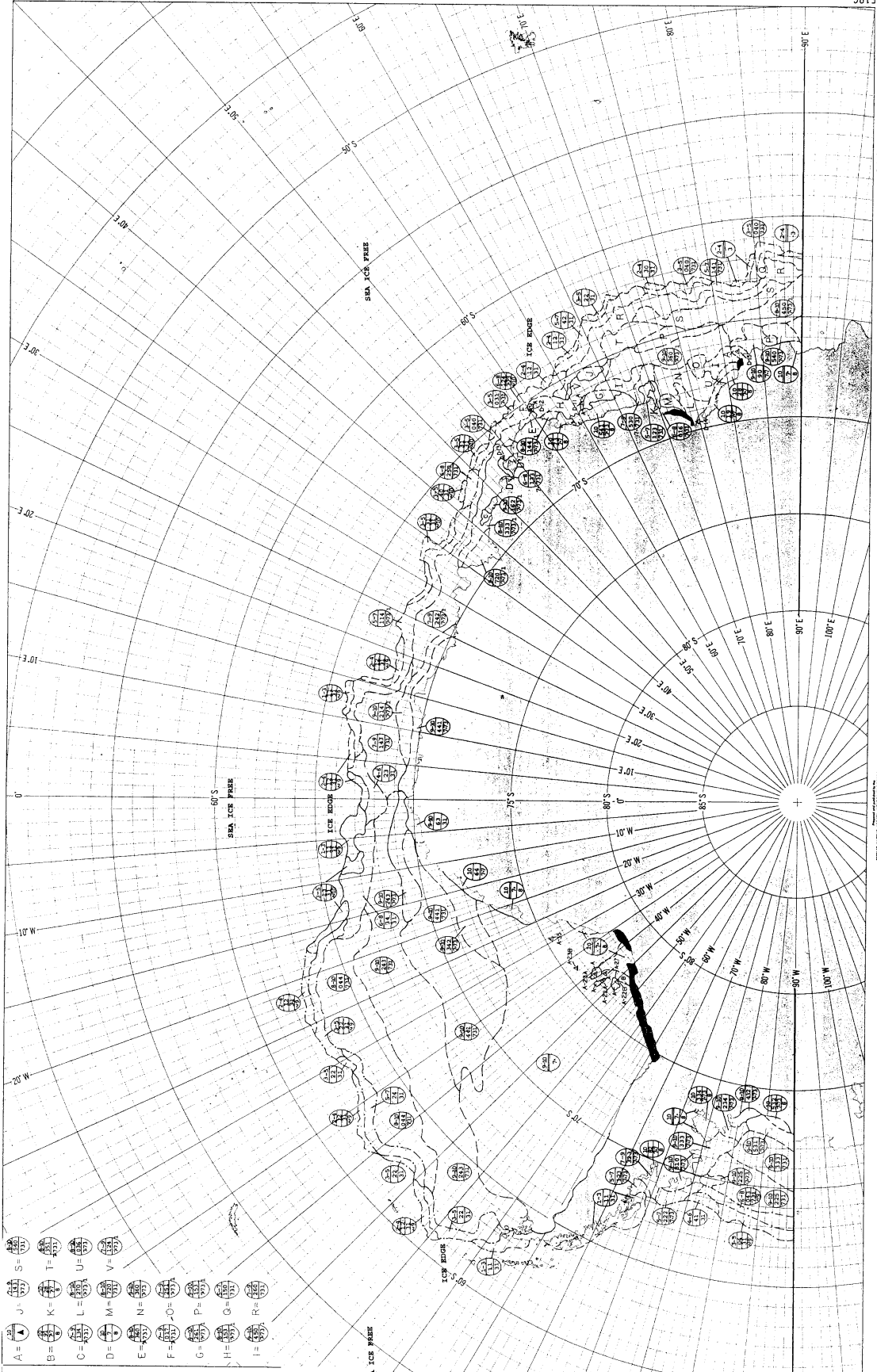
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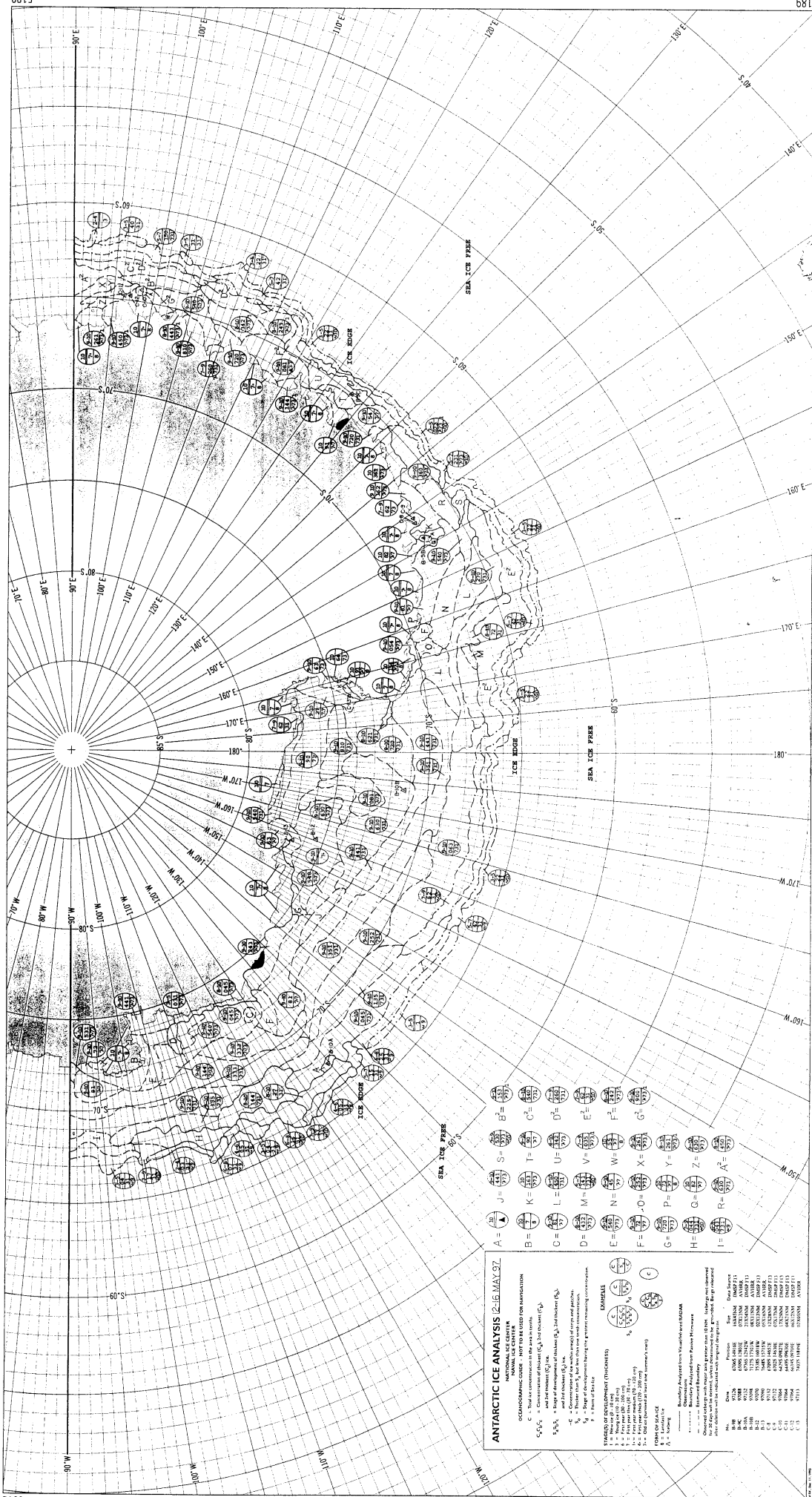
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9 = Eighth year (1-31 Dec)



Prepared by: [illegible]  
Date: 12-16 MAY 92

Source: [illegible]  
Scale: 1:100,000



ANTARCTIC ICE ANALYSIS 2-15 MAY 1972

ICE ANALYSIS SYMBOLS  
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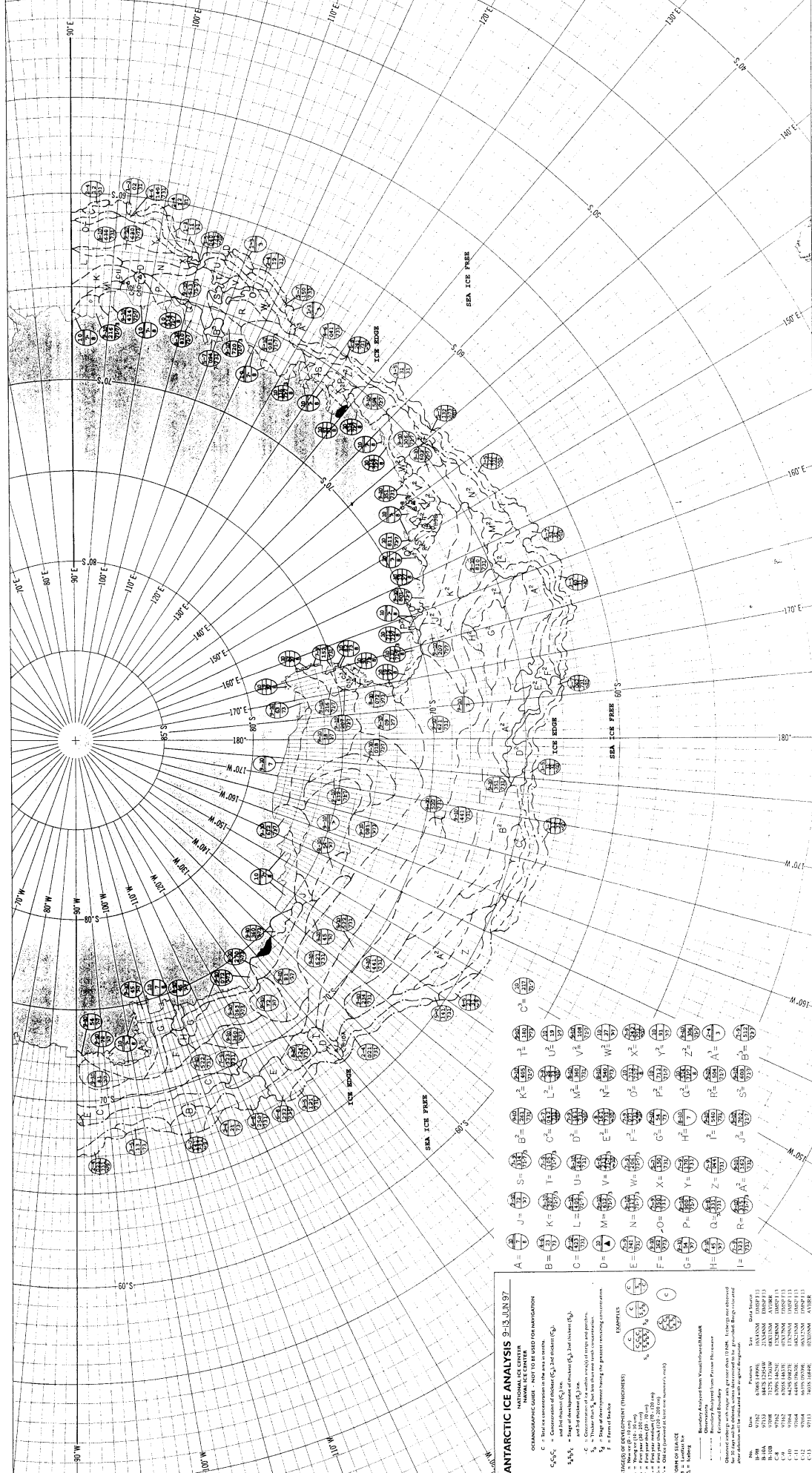












ANTARCTIC ICE ANALYSIS 9-15 JUN 57

NATIONAL ICE CENTER  
OCEANOGRAPHIC GUIDE - NOT TO BE USED FOR NAVIGATION

$C =$  Ice concentration in the area in tenths  
 $C_1, C_2, C_3 =$  Concentration of ice in the area in tenths  
 $S_1, S_2, S_3 =$  Stage of development of ice in the area in tenths  
 $S_1 =$  Stage of development of ice in the area in tenths  
 $S_2 =$  Stage of development of ice in the area in tenths  
 $S_3 =$  Stage of development of ice in the area in tenths

EXAMPLES

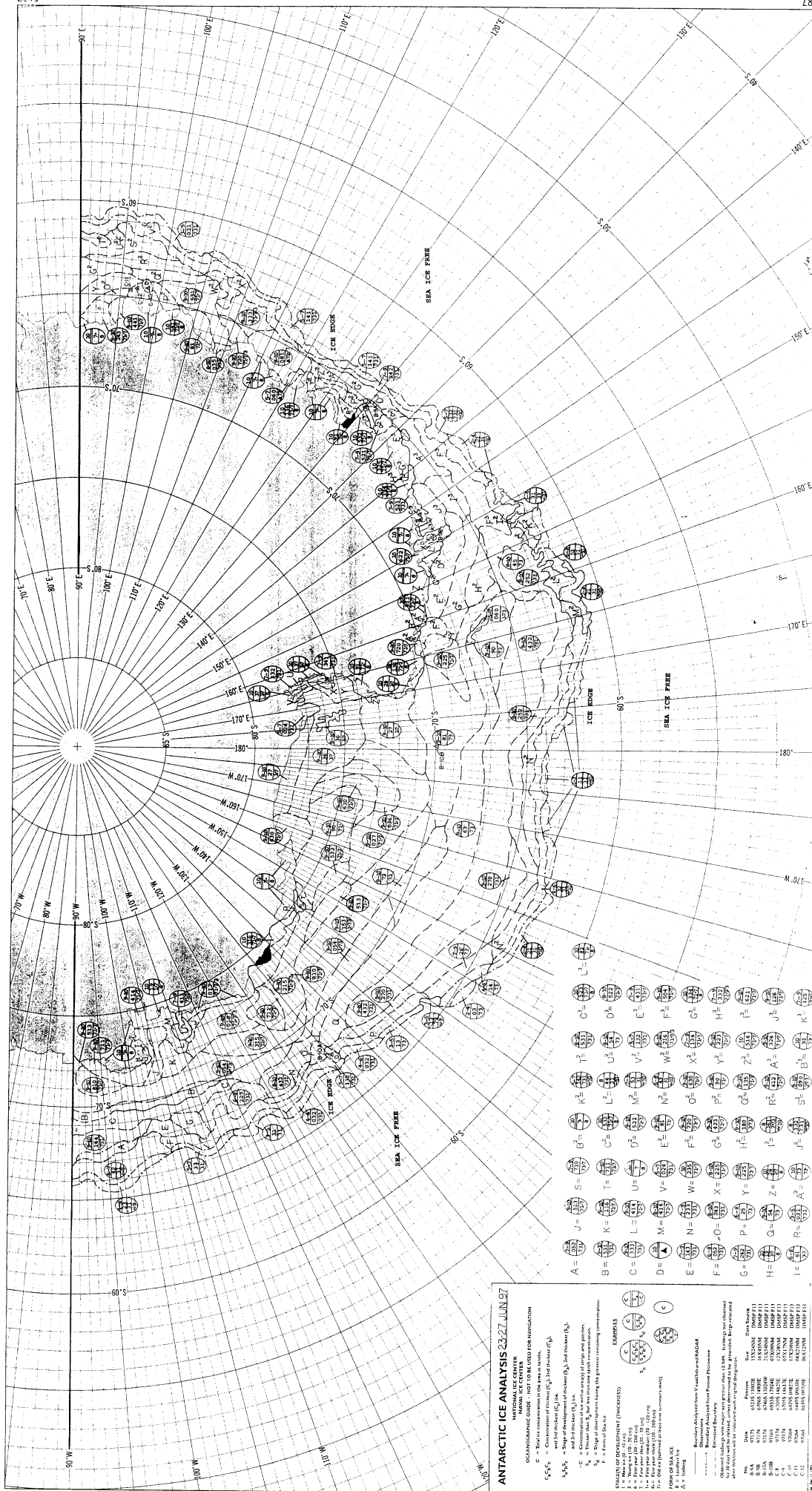
1.  $C = 100$  (100%)  
2.  $C = 100$  (100%)  
3.  $C = 100$  (100%)  
4.  $C = 100$  (100%)  
5.  $C = 100$  (100%)  
6.  $C = 100$  (100%)  
7.  $C = 100$  (100%)  
8.  $C = 100$  (100%)  
9.  $C = 100$  (100%)  
10.  $C = 100$  (100%)  
11.  $C = 100$  (100%)  
12.  $C = 100$  (100%)  
13.  $C = 100$  (100%)  
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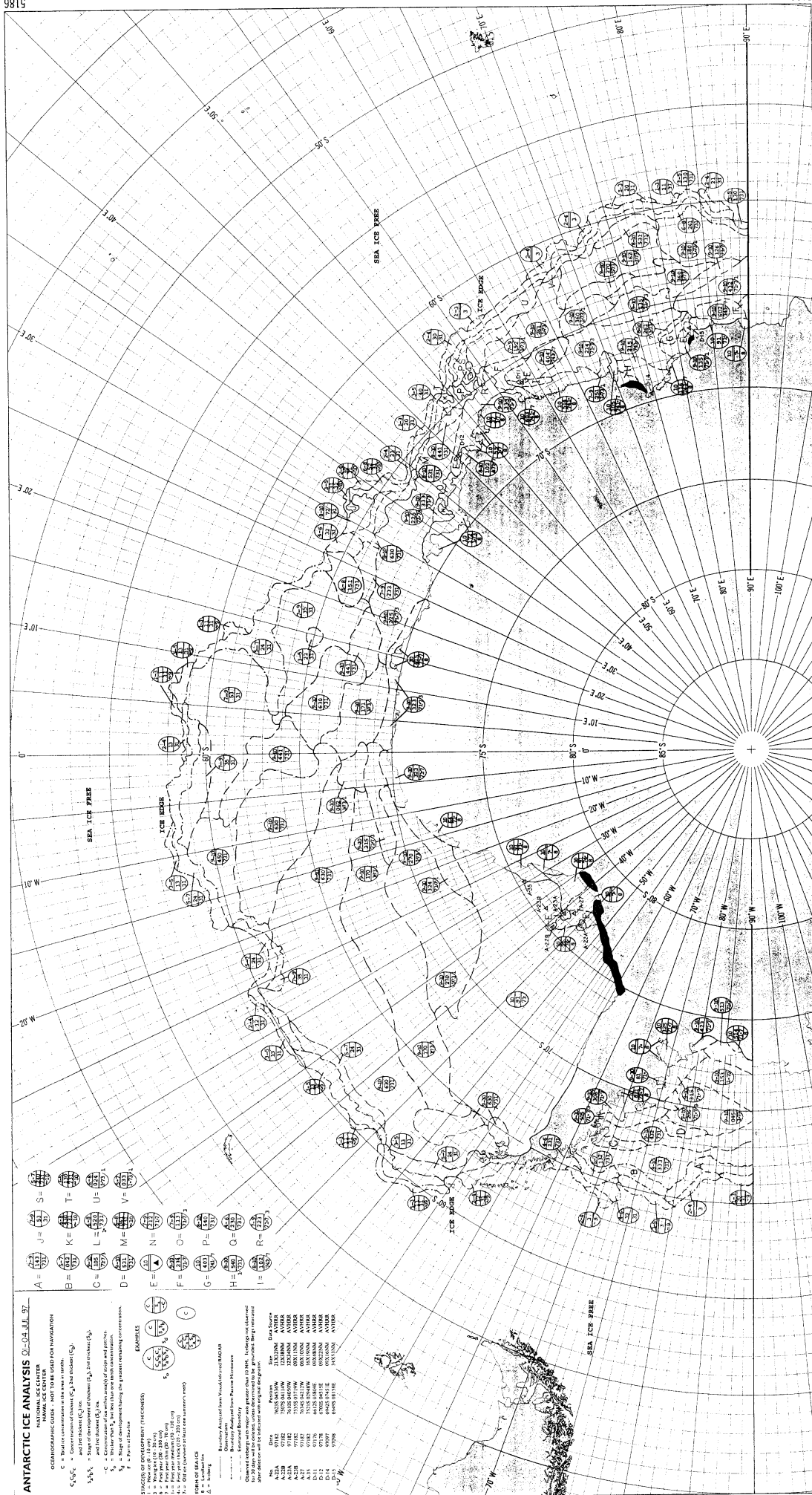












Projection: Polar Stereographic  
Scale: 1:100,000

Source: National Ice Center, U.S. Navy  
Date: 1991

# ANTARCTIC ICE ANALYSIS 01-04 JUL 97

NATIONAL ICE CENTER  
NAVY ICE CENTER

ANTARCTIC COASTLINE - FIRST 1000 METERS  
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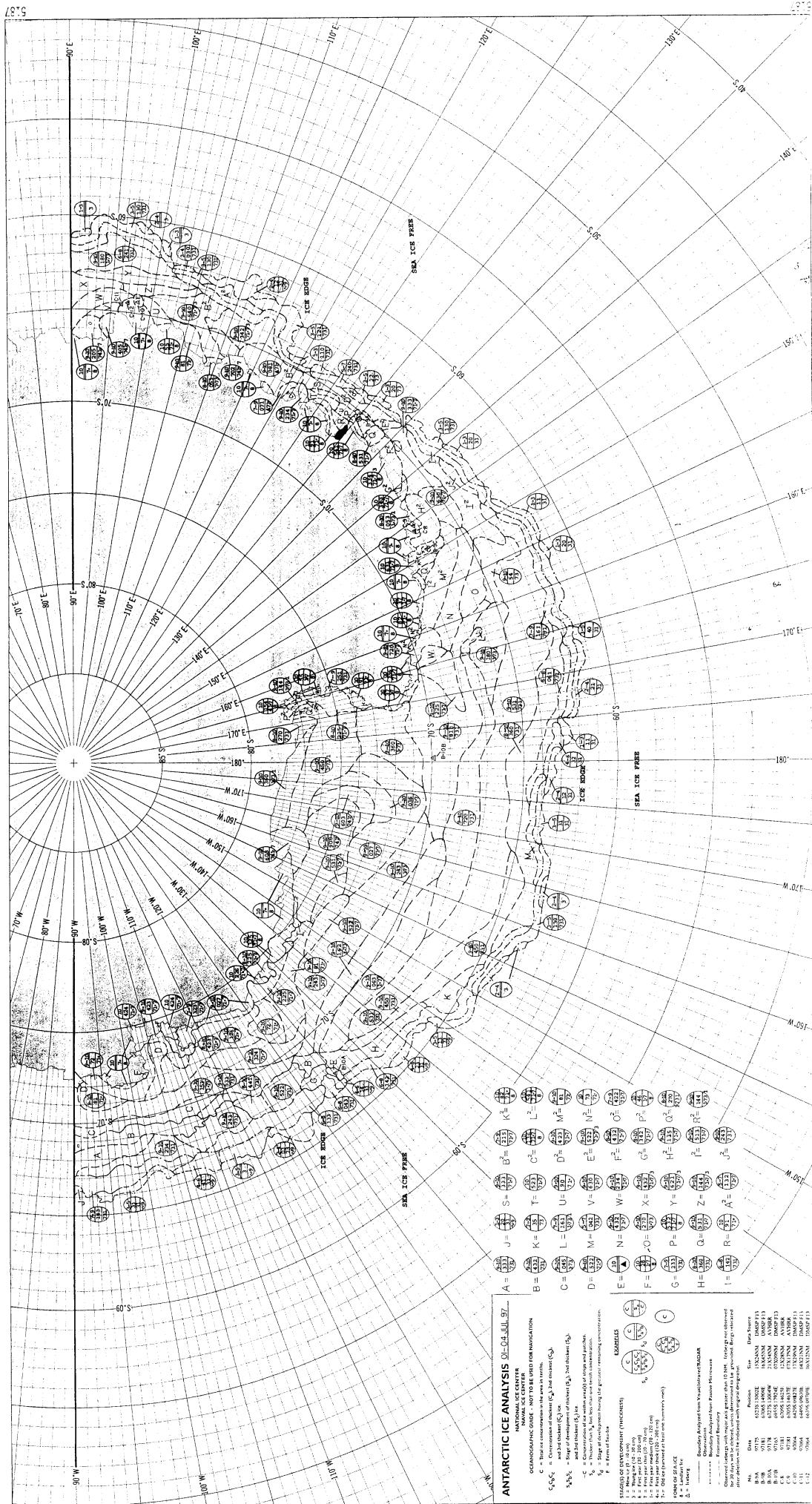
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**ANTARCTIC ICE ANALYSIS** 01-04-97

**NATIONAL ICE CENTER**

**OPERATIONAL PROCEDURES FOR NAVIGATION**

**1. Symbols and Abbreviations**

**1.1. Ice Symbols**

**1.2. Ice Abbreviations**

**2. Stages of Development (Thickness)**

**3. Ice Symbols and Abbreviations**

**4. Ice Symbols and Abbreviations**

**5. Ice Symbols and Abbreviations**

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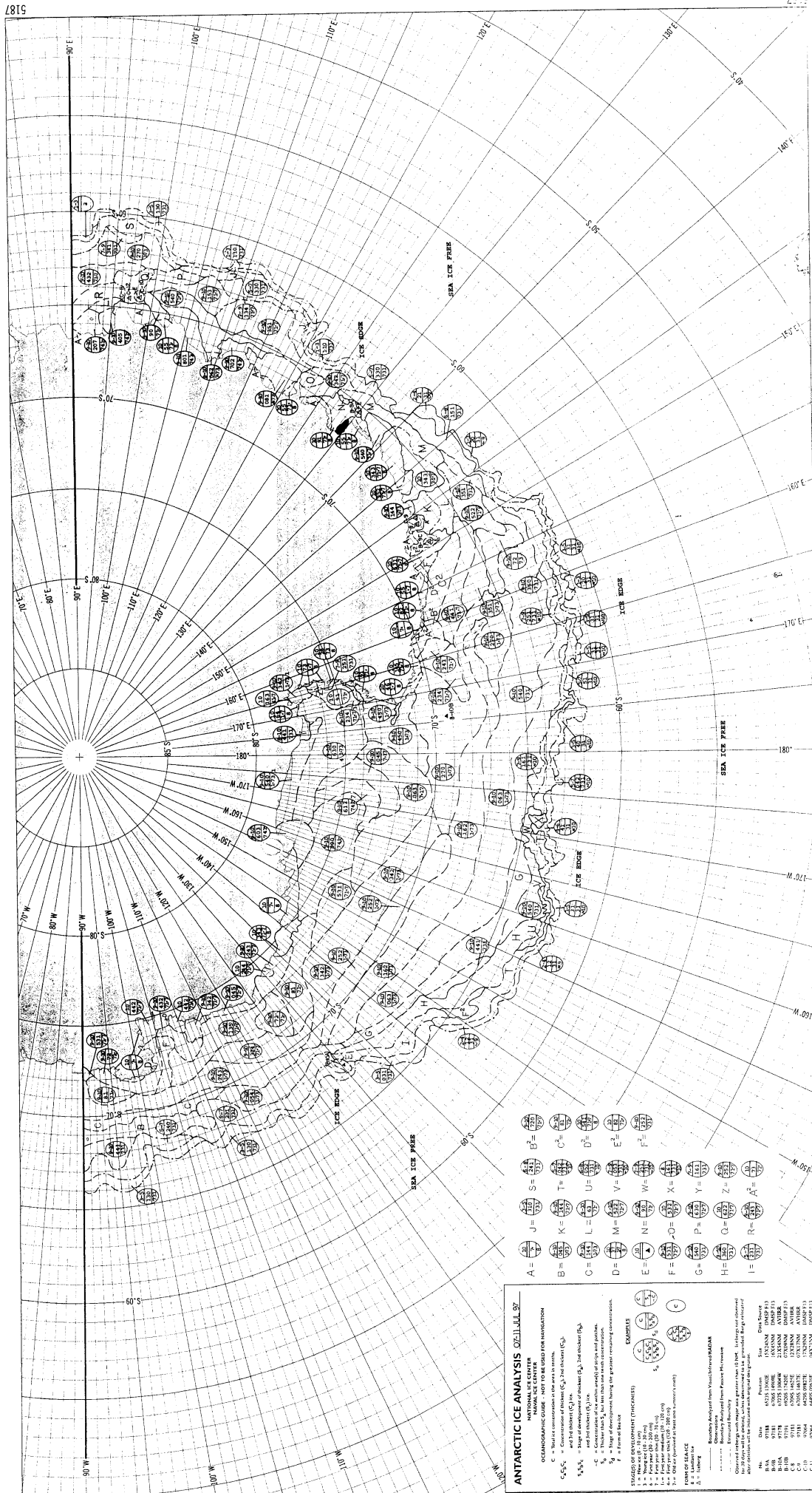
**98. Ice Symbols and Abbreviations**

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**100. Ice Symbols and Abbreviations**







Revised Oceanographic Publications  
NO. 17, 1968

NO. 17, 1968

ANTARCTIC ICE ANALYSIS 021111Z 97

NATIONAL ICE CENTER  
OCEANOGRAPHIC CHARTS - NOT TO BE USED FOR NAVIGATION

C = Total ice concentration in the area in percent.  
 $C_1, C_2, C_3$  = Concentration of thickets ( $C_1$ ), and thickets ( $C_2$ ), and icebergs ( $C_3$ ) in percent.

$C_1, C_2, C_3$  = Concentration of thickets ( $C_1$ ), and thickets ( $C_2$ ), and icebergs ( $C_3$ ) in percent.

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STANDARD OF DEVELOPMENT (THICKNESS)

1 = None (0-10 cm)

2 = 10-20 cm

3 = 20-30 cm

4 = 30-40 cm

5 = 40-50 cm

6 = 50-60 cm

7 = 60-70 cm

8 = 70-80 cm

9 = 80-90 cm

10 = 90-100 cm

11 = 100-110 cm

12 = 110-120 cm

13 = 120-130 cm

14 = 130-140 cm

15 = 140-150 cm

16 = 150-160 cm

17 = 160-170 cm

18 = 170-180 cm

19 = 180-190 cm

20 = 190-200 cm

21 = 200-210 cm

22 = 210-220 cm

23 = 220-230 cm

24 = 230-240 cm

25 = 240-250 cm

26 = 250-260 cm

27 = 260-270 cm

28 = 270-280 cm

29 = 280-290 cm

30 = 290-300 cm

31 = 300-310 cm

32 = 310-320 cm

FORM OF SPACE

1 = 1000 m

2 = 2000 m

3 = 3000 m

4 = 4000 m

5 = 5000 m

6 = 6000 m

7 = 7000 m

8 = 8000 m

9 = 9000 m

10 = 10000 m

11 = 11000 m

12 = 12000 m

13 = 13000 m

14 = 14000 m

15 = 15000 m

16 = 16000 m

17 = 17000 m

18 = 18000 m

19 = 19000 m

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25 = 25000 m

26 = 26000 m

27 = 27000 m

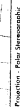
28 = 28000 m

29 = 29000 m

30 = 30000 m

31 = 31000 m

32 = 32000 m

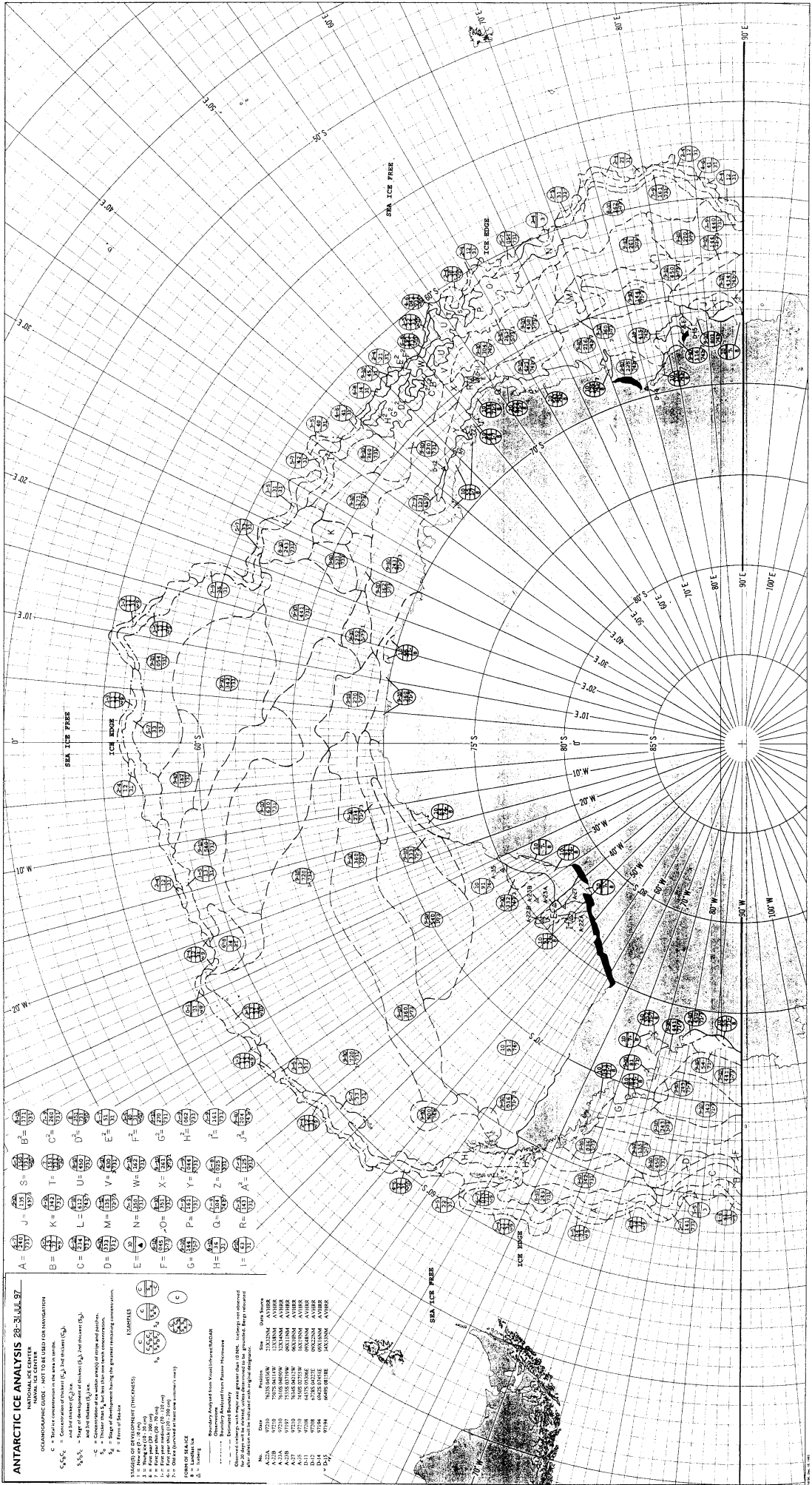






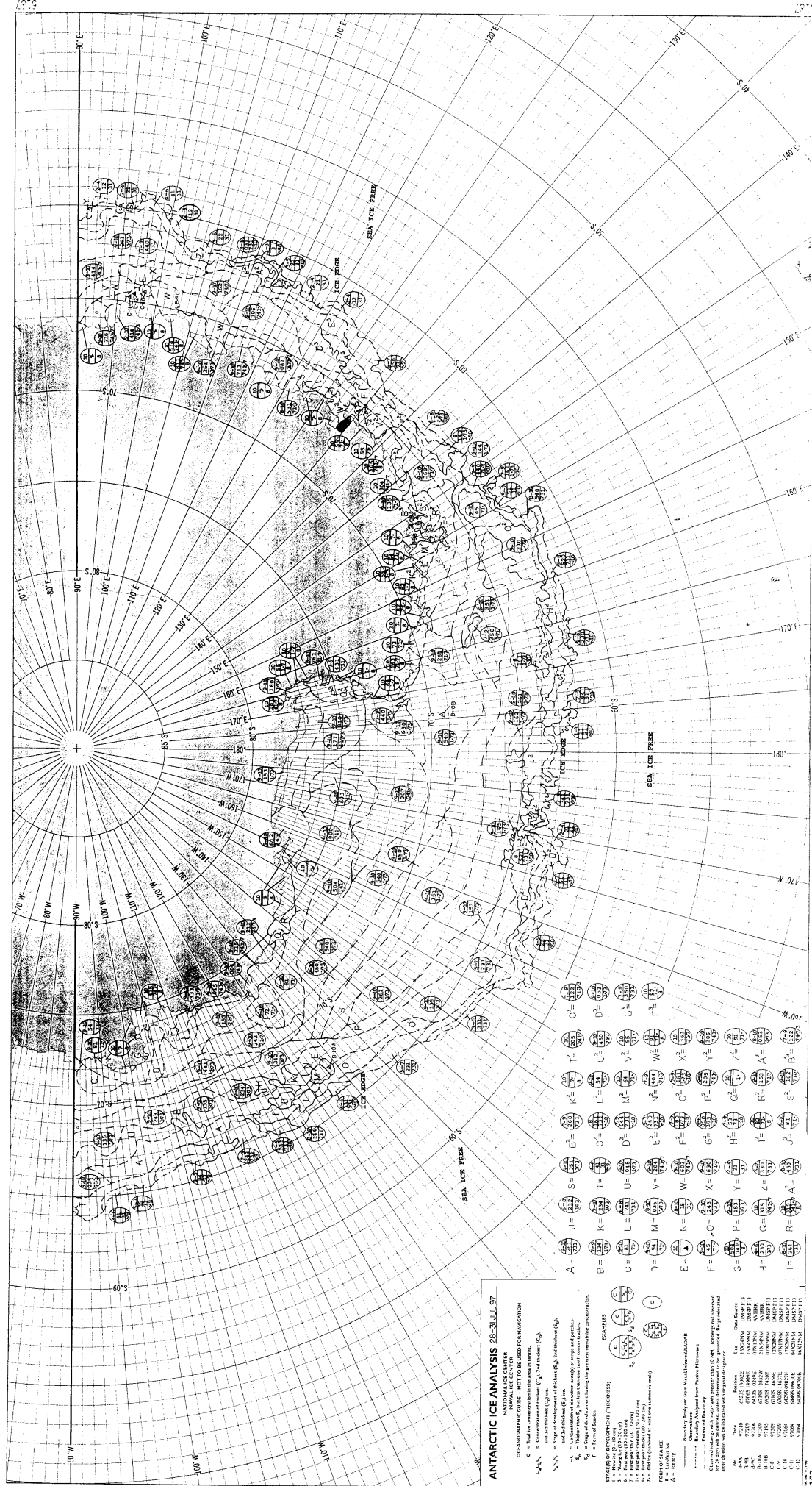






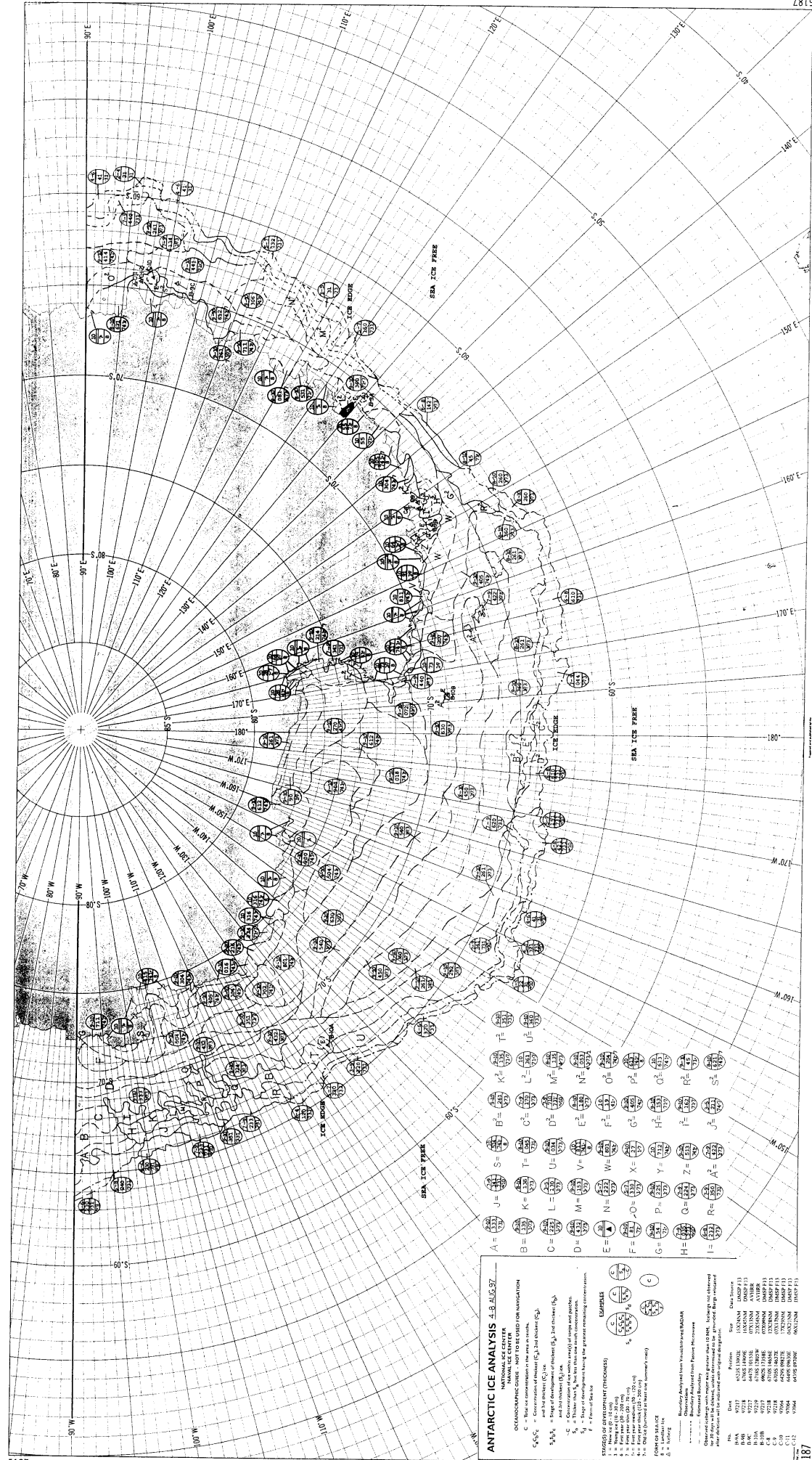
ANTARCTIC ICE ANALYSIS 28 JUL 97

NATIONAL ICE CENTER  
OCEANOGRAPHIC GUIDE - NOT TO BE USED FOR NAVIGATION  
C = Total ice concentration in the area to search.  
C<sub>1</sub>, C<sub>2</sub>, C<sub>3</sub> = Concentrations of thick, medium, and thin ice.  
S<sub>1</sub>, S<sub>2</sub>, S<sub>3</sub> = Stage of development of thick, medium, and thin ice.  
T<sub>1</sub>, T<sub>2</sub>, T<sub>3</sub> = Thickness of thick, medium, and thin ice.  
V<sub>1</sub>, V<sub>2</sub>, V<sub>3</sub> = Velocity of thick, medium, and thin ice.  
D<sub>1</sub>, D<sub>2</sub>, D<sub>3</sub> = Direction of thick, medium, and thin ice.  
E<sub>1</sub>, E<sub>2</sub>, E<sub>3</sub> = Edge of thick, medium, and thin ice.  
F<sub>1</sub>, F<sub>2</sub>, F<sub>3</sub> = Form of thick, medium, and thin ice.  
A<sub>1</sub>, A<sub>2</sub>, A<sub>3</sub> = Area of thick, medium, and thin ice.  
P<sub>1</sub>, P<sub>2</sub>, P<sub>3</sub> = Period of thick, medium, and thin ice.  
Q<sub>1</sub>, Q<sub>2</sub>, Q<sub>3</sub> = Quantity of thick, medium, and thin ice.  
R<sub>1</sub>, R<sub>2</sub>, R<sub>3</sub> = Ratio of thick, medium, and thin ice.  
S<sub>1</sub>, S<sub>2</sub>, S<sub>3</sub> = Significance of thick, medium, and thin ice.  
T<sub>1</sub>, T<sub>2</sub>, T<sub>3</sub> = Time of thick, medium, and thin ice.  
U<sub>1</sub>, U<sub>2</sub>, U<sub>3</sub> = Unit of thick, medium, and thin ice.  
V<sub>1</sub>, V<sub>2</sub>, V<sub>3</sub> = Value of thick, medium, and thin ice.  
W<sub>1</sub>, W<sub>2</sub>, W<sub>3</sub> = Weight of thick, medium, and thin ice.  
X<sub>1</sub>, X<sub>2</sub>, X<sub>3</sub> = X-axis of thick, medium, and thin ice.  
Y<sub>1</sub>, Y<sub>2</sub>, Y<sub>3</sub> = Y-axis of thick, medium, and thin ice.  
Z<sub>1</sub>, Z<sub>2</sub>, Z<sub>3</sub> = Z-axis of thick, medium, and thin ice.  
AA<sub>1</sub>, AA<sub>2</sub>, AA<sub>3</sub> = AA-axis of thick, medium, and thin ice.  
BB<sub>1</sub>, BB<sub>2</sub>, BB<sub>3</sub> = BB-axis of thick, medium, and thin ice.  
CC<sub>1</sub>, CC<sub>2</sub>, CC<sub>3</sub> = CC-axis of thick, medium, and thin ice.  
DD<sub>1</sub>, DD<sub>2</sub>, DD<sub>3</sub> = DD-axis of thick, medium, and thin ice.  
EE<sub>1</sub>, EE<sub>2</sub>, EE<sub>3</sub> = EE-axis of thick, medium, and thin ice.  
FF<sub>1</sub>, FF<sub>2</sub>, FF<sub>3</sub> = FF-axis of thick, medium, and thin ice.  
GG<sub>1</sub>, GG<sub>2</sub>, GG<sub>3</sub> = GG-axis of thick, medium, and thin ice.  
HH<sub>1</sub>, HH<sub>2</sub>, HH<sub>3</sub> = HH-axis of thick, medium, and thin ice.  
II<sub>1</sub>, II<sub>2</sub>, II<sub>3</sub> = II-axis of thick, medium, and thin ice.  
JJ<sub>1</sub>, JJ<sub>2</sub>, JJ<sub>3</sub> = JJ-axis of thick, medium, and thin ice.  
KK<sub>1</sub>, KK<sub>2</sub>, KK<sub>3</sub> = KK-axis of thick, medium, and thin ice.  
LL<sub>1</sub>, LL<sub>2</sub>, LL<sub>3</sub> = LL-axis of thick, medium, and thin ice.  
MM<sub>1</sub>, MM<sub>2</sub>, MM<sub>3</sub> = MM-axis of thick, medium, and thin ice.  
NN<sub>1</sub>, NN<sub>2</sub>, NN<sub>3</sub> = NN-axis of thick, medium, and thin ice.  
OO<sub>1</sub>, OO<sub>2</sub>, OO<sub>3</sub> = OO-axis of thick, medium, and thin ice.  
PP<sub>1</sub>, PP<sub>2</sub>, PP<sub>3</sub> = PP-axis of thick, medium, and thin ice.  
QQ<sub>1</sub>, QQ<sub>2</sub>, QQ<sub>3</sub> = QQ-axis of thick, medium, and thin ice.  
RR<sub>1</sub>, RR<sub>2</sub>, RR<sub>3</sub> = RR-axis of thick, medium, and thin ice.  
SS<sub>1</sub>, SS<sub>2</sub>, SS<sub>3</sub> = SS-axis of thick, medium, and thin ice.  
TT<sub>1</sub>, TT<sub>2</sub>, TT<sub>3</sub> = TT-axis of thick, medium, and thin ice.  
UU<sub>1</sub>, UU<sub>2</sub>, UU<sub>3</sub> = UU-axis of thick, medium, and thin ice.  
VV<sub>1</sub>, VV<sub>2</sub>, VV<sub>3</sub> = VV-axis of thick, medium, and thin ice.  
WW<sub>1</sub>, WW<sub>2</sub>, WW<sub>3</sub> = WW-axis of thick, medium, and thin ice.  
XX<sub>1</sub>, XX<sub>2</sub>, XX<sub>3</sub> = XX-axis of thick, medium, and thin ice.  
YY<sub>1</sub>, YY<sub>2</sub>, YY<sub>3</sub> = YY-axis of thick, medium, and thin ice.  
ZZ<sub>1</sub>, ZZ<sub>2</sub>, ZZ<sub>3</sub> = ZZ-axis of thick, medium, and thin ice.  
AAA<sub>1</sub>, AAA<sub>2</sub>, AAA<sub>3</sub> = AAA-axis of thick, medium, and thin ice.  
BBB<sub>1</sub>, BBB<sub>2</sub>, BBB<sub>3</sub> = BBB-axis of thick, medium, and thin ice.  
CCC<sub>1</sub>, CCC<sub>2</sub>, CCC<sub>3</sub> = CCC-axis of thick, medium, and thin ice.  
DDD<sub>1</sub>, DDD<sub>2</sub>, DDD<sub>3</sub> = DDD-axis of thick, medium, and thin ice.  
EEE<sub>1</sub>, EEE<sub>2</sub>, EEE<sub>3</sub> = EEE-axis of thick, medium, and thin ice.  
FFF<sub>1</sub>, FFF<sub>2</sub>, FFF<sub>3</sub> = FFF-axis of thick, medium, and thin ice.  
GGG<sub>1</sub>, GGG<sub>2</sub>, GGG<sub>3</sub> = GGG-axis of thick, medium, and thin ice.  
HHH<sub>1</sub>, HHH<sub>2</sub>, HHH<sub>3</sub> = HHH-axis of thick, medium, and thin ice.  
III<sub>1</sub>, III<sub>2</sub>, III<sub>3</sub> = III-axis of thick, medium, and thin ice.  
JJJ<sub>1</sub>, JJJ<sub>2</sub>, JJJ<sub>3</sub> = JJJ-axis of thick, medium, and thin ice.  
KKK<sub>1</sub>, KKK<sub>2</sub>, KKK<sub>3</sub> = KKK-axis of thick, medium, and thin ice.  
LLL<sub>1</sub>, LLL<sub>2</sub>, LLL<sub>3</sub> = LLL-axis of thick, medium, and thin ice.  
MMM<sub>1</sub>, MMM<sub>2</sub>, MMM<sub>3</sub> = MMM-axis of thick, medium, and thin ice.  
NNN<sub>1</sub>, NNN<sub>2</sub>, NNN<sub>3</sub> = NNN-axis of thick, medium, and thin ice.  
OOO<sub>1</sub>, OOO<sub>2</sub>, OOO<sub>3</sub> = OOO-axis of thick, medium, and thin ice.  
PPP<sub>1</sub>, PPP<sub>2</sub>, PPP<sub>3</sub> = PPP-axis of thick, medium, and thin ice.  
QQQ<sub>1</sub>, QQQ<sub>2</sub>, QQQ<sub>3</sub> = QQQ-axis of thick, medium, and thin ice.  
RRR<sub>1</sub>, RRR<sub>2</sub>, RRR<sub>3</sub> = RRR-axis of thick, medium, and thin ice.  
SSS<sub>1</sub>, SSS<sub>2</sub>, SSS<sub>3</sub> = SSS-axis of thick, medium, and thin ice.  
TTT<sub>1</sub>, TTT<sub>2</sub>, TTT<sub>3</sub> = TTT-axis of thick, medium, and thin ice.  
UUU<sub>1</sub>, UUU<sub>2</sub>, UUU<sub>3</sub> = UUU-axis of thick, medium, and thin ice.  
VVV<sub>1</sub>, VVV<sub>2</sub>, VVV<sub>3</sub> = VVV-axis of thick, medium, and thin ice.  
WWW<sub>1</sub>, WWW<sub>2</sub>, WWW<sub>3</sub> = WWW-axis of thick, medium, and thin ice.  
XXX<sub>1</sub>, XXX<sub>2</sub>, XXX<sub>3</sub> = XXX-axis of thick, medium, and thin ice.  
YYY<sub>1</sub>, YYY<sub>2</sub>, YYY<sub>3</sub> = YYY-axis of thick, medium, and thin ice.  
ZZZ<sub>1</sub>, ZZZ<sub>2</sub>, ZZZ<sub>3</sub> = ZZZ-axis of thick, medium, and thin ice.  
AAAA<sub>1</sub>, AAAA<sub>2</sub>, AAAA<sub>3</sub> = AAAA-axis of thick, medium, and thin ice.  
BBBB<sub>1</sub>, BBBB<sub>2</sub>, BBBB<sub>3</sub> = BBBB-axis of thick, medium, and thin ice.  
CCCC<sub>1</sub>, CCCC<sub>2</sub>, CCCC<sub>3</sub> = CCCC-axis of thick, medium, and thin ice.  
DDDD<sub>1</sub>, DDDD<sub>2</sub>, DDDD<sub>3</sub> = DDDD-axis of thick, medium, and thin ice.  
EEEE<sub>1</sub>, EEEE<sub>2</sub>, EEEE<sub>3</sub> = EEEE-axis of thick, medium, and thin ice.  
FFFF<sub>1</sub>, FFFF<sub>2</sub>, FFFF<sub>3</sub> = FFFF-axis of thick, medium, and thin ice.  
GGGG<sub>1</sub>, GGGG<sub>2</sub>, GGGG<sub>3</sub> = GGGG-axis of thick, medium, and thin ice.  
HHHH<sub>1</sub>, HHHH<sub>2</sub>, HHHH<sub>3</sub> = HHHH-axis of thick, medium, and thin ice.  
IIII<sub>1</sub>, IIII<sub>2</sub>, IIII<sub>3</sub> = IIII-axis of thick, medium, and thin ice.  
JJJJ<sub>1</sub>, JJJJ<sub>2</sub>, JJJJ<sub>3</sub> = JJJJ-axis of thick, medium, and thin ice.  
KKKK<sub>1</sub>, KKKK<sub>2</sub>, KKKK<sub>3</sub> = KKKK-axis of thick, medium, and thin ice.  
LLLL<sub>1</sub>, LLLL<sub>2</sub>, LLLL<sub>3</sub> = LLLL-axis of thick, medium, and thin ice.  
MMMM<sub>1</sub>, MMMM<sub>2</sub>, MMMM<sub>3</sub> = MMMM-axis of thick, medium, and thin ice.  
NNNN<sub>1</sub>, NNNN<sub>2</sub>, NNNN<sub>3</sub> = NNNN-axis of thick, medium, and thin ice.  
OOOO<sub>1</sub>, OOOO<sub>2</sub>, OOOO<sub>3</sub> = OOOO-axis of thick, medium, and thin ice.  
PPPP<sub>1</sub>, PPPP<sub>2</sub>, PPPP<sub>3</sub> = PPPP-axis of thick, medium, and thin ice.  
QQQQ<sub>1</sub>, QQQQ<sub>2</sub>, QQQQ<sub>3</sub> = QQQQ-axis of thick, medium, and thin ice.  
RRRR<sub>1</sub>, RRRR<sub>2</sub>, RRRR<sub>3</sub> = RRRR-axis of thick, medium, and thin ice.  
SSSS<sub>1</sub>, SSSS<sub>2</sub>, SSSS<sub>3</sub> = SSSS-axis of thick, medium, and thin ice.  
TTTT<sub>1</sub>, TTTT<sub>2</sub>, TTTT<sub>3</sub> = TTTT-axis of thick, medium, and thin ice.  
UUUU<sub>1</sub>, UUUU<sub>2</sub>, UUUU<sub>3</sub> = UUUU-axis of thick, medium, and thin ice.  
VVVV<sub>1</sub>, VVVV<sub>2</sub>, VVVV<sub>3</sub> = VVVV-axis of thick, medium, and thin ice.  
WWWW<sub>1</sub>, WWWW<sub>2</sub>, WWWW<sub>3</sub> = WWWW-axis of thick, medium, and thin ice.  
XXXX<sub>1</sub>, XXXX<sub>2</sub>, XXXX<sub>3</sub> = XXXX-axis of thick, medium, and thin ice.  
YYYY<sub>1</sub>, YYYY<sub>2</sub>, YYYY<sub>3</sub> = YYYY-axis of thick, medium, and thin ice.  
ZZZZ<sub>1</sub>, ZZZZ<sub>2</sub>, ZZZZ<sub>3</sub> = ZZZZ-axis of thick, medium, and thin ice.  
AAAAA<sub>1</sub>, AAAAA<sub>2</sub>, AAAAA<sub>3</sub> = AAAAA-axis of thick, medium, and thin ice.  
BBBBB<sub>1</sub>, BBBB<sub>2</sub>, BBBB<sub>3</sub> = BBBB-axis of thick, medium, and thin ice.  
CCCCC<sub>1</sub>, CCCCC<sub>2</sub>, CCCCC<sub>3</sub> = CCCCC-axis of thick, medium, and thin ice.  
DDDDD<sub>1</sub>, DDDDD<sub>2</sub>, DDDDD<sub>3</sub> = DDDDD-axis of thick, medium, and thin ice.  
EEEEE<sub>1</sub>, EEEEE<sub>2</sub>, EEEEE<sub>3</sub> = EEEEE-axis of thick, medium, and thin ice.  
FFFFF<sub>1</sub>, FFFFF<sub>2</sub>, FFFFF<sub>3</sub> = FFFFF-axis of thick, medium, and thin ice.  
GGGGG<sub>1</sub>, GGGGG<sub>2</sub>, GGGGG<sub>3</sub> = GGGGG-axis of thick, medium, and thin ice.  
HHHHH<sub>1</sub>, HHHHH<sub>2</sub>, HHHHH<sub>3</sub> = HHHHH-axis of thick, medium, and thin ice.  
IIIII<sub>1</sub>, IIIII<sub>2</sub>, IIIII<sub>3</sub> = IIIII-axis of thick, medium, and thin ice.  
JJJJJ<sub>1</sub>, JJJJJ<sub>2</sub>, JJJJJ<sub>3</sub> = JJJJJ-axis of thick, medium, and thin ice.  
KKKKK<sub>1</sub>, KKKKK<sub>2</sub>, KKKKK<sub>3</sub> = KKKKK-axis of thick, medium, and thin ice.  
LLLLL<sub>1</sub>, LLLLL<sub>2</sub>, LLLLL<sub>3</sub> = LLLLL-axis of thick, medium, and thin ice.  
MMMMM<sub>1</sub>, MMMMM<sub>2</sub>, MMMMM<sub>3</sub> = MMMMM-axis of thick, medium, and thin ice.  
NNNNN<sub>1</sub>, NNNNN<sub>2</sub>, NNNNN<sub>3</sub> = NNNNN-axis of thick, medium, and thin ice.  
OOOOO<sub>1</sub>, OOOOO<sub>2</sub>, OOOOO<sub>3</sub> = OOOOO-axis of thick, medium, and thin ice.  
PPPPP<sub>1</sub>, PPPPP<sub>2</sub>, PPPPP<sub>3</sub> = PPPPP-axis of thick, medium, and thin ice.  
QQQQQ<sub>1</sub>, QQQQQ<sub>2</sub>, QQQQQ<sub>3</sub> = QQQQQ-axis of thick, medium, and thin ice.  
RRRRR<sub>1</sub>, RRRRR<sub>2</sub>, RRRRR<sub>3</sub> = RRRRR-axis of thick, medium, and thin ice.  
SSSSS<sub>1</sub>, SSSSS<sub>2</sub>, SSSSS<sub>3</sub> = SSSSS-axis of thick, medium, and thin ice.  
TTTTT<sub>1</sub>, TTTTT<sub>2</sub>, TTTTT<sub>3</sub> = TTTTT-axis of thick, medium, and thin ice.  
UUUUU<sub>1</sub>, UUUUU<sub>2</sub>, UUUUU<sub>3</sub> = UUUUU-axis of thick, medium, and thin ice.  
VVVVV<sub>1</sub>, VVVVV<sub>2</sub>, VVVVV<sub>3</sub> = VVVVV-axis of thick, medium, and thin ice.  
WWWWW<sub>1</sub>, WWWWW<sub>2</sub>, WWWWW<sub>3</sub> = WWWWW-axis of thick, medium, and thin ice.  
XXXXX<sub>1</sub>, XXXXX<sub>2</sub>, XXXXX<sub>3</sub> = XXXXX-axis of thick, medium, and thin ice.  
YYYYY<sub>1</sub>, YYYYY<sub>2</sub>, YYYYY<sub>3</sub> = YYYYY-axis of thick, medium, and thin ice.  
ZZZZZ<sub>1</sub>, ZZZZZ<sub>2</sub>, ZZZZZ<sub>3</sub> = ZZZZZ-axis of thick, medium, and thin ice.  
AAAAA<sub>1</sub>, AAAAA<sub>2</sub>, AAAAA<sub>3</sub> = AAAAA-axis of thick, medium, and thin ice.  
BBBBB<sub>1</sub>, BBBB<sub>2</sub>, BBBB<sub>3</sub> = BBBB-axis of thick, medium, and thin ice.  
CCCCC<sub>1</sub>, CCCCC<sub>2</sub>, CCCCC<sub>3</sub> = CCCCC-axis of thick, medium, and thin ice.  
DDDDD<sub>1</sub>, DDDDD<sub>2</sub>, DDDDD<sub>3</sub> = DDDDD-axis of thick, medium, and thin ice.  
EEEEE<sub>1</sub>, EEEEE<sub>2</sub>, EEEEE<sub>3</sub> = EEEEE-axis of thick, medium, and thin ice.  
FFFFF<sub>1</sub>, FFFFF<sub>2</sub>, FFFFF<sub>3</sub> = FFFFF-axis of thick, medium, and thin ice.  
GGGGG<sub>1</sub>, GGGGG<sub>2</sub>, GGGGG<sub>3</sub> = GGGGG-axis of thick, medium, and thin ice.  
HHHHH<sub>1</sub>, HHHHH<sub>2</sub>, HHHHH<sub>3</sub> = HHHHH-axis of thick, medium, and thin ice.  
IIIII<sub>1</sub>, IIIII<sub>2</sub>, IIIII<sub>3</sub> = IIIII-axis of thick, medium, and thin ice.  
JJJJJ<sub>1</sub>, JJJJJ<sub>2</sub>, JJJJJ<sub>3</sub> = JJJJJ-axis of thick, medium, and thin ice.  
KKKKK<sub>1</sub>, KKKKK<sub>2</sub>, KKKKK<sub>3</sub> = KKKKK-axis of thick, medium, and thin ice.  
LLLLL<sub>1</sub>, LLLLL<sub>2</sub>, LLLLL<sub>3</sub> = LLLLL-axis of thick, medium, and thin ice.  
MMMMM<sub>1</sub>, MMMMM<sub>2</sub>, MMMMM<sub>3</sub> = MMMMM-axis of thick, medium, and thin ice.  
NNNNN<sub>1</sub>, NNNNN<sub>2</sub>, NNNNN<sub>3</sub> = NNNNN-axis of thick, medium, and thin ice.  
OOOOO<sub>1</sub>, OOOOO<sub>2</sub>, OOOOO<sub>3</sub> = OOOOO-axis of thick, medium, and thin ice.  
PPPPP<sub>1</sub>, PPPPP<sub>2</sub>, PPPPP<sub>3</sub> = PPPPP-axis of thick, medium, and thin ice.  
QQQQQ<sub>1</sub>, QQQQQ<sub>2</sub>, QQQQQ<sub>3</sub> = QQQQQ-axis of thick, medium, and thin ice.  
RRRRR<sub>1</sub>, RRRRR<sub>2</sub>, RRRRR<sub>3</sub> = RRRRR-axis of thick, medium, and thin ice.  
SSSSS<sub>1</sub>, SSSSS<sub>2</sub>, SSSSS<sub>3</sub> = SSSSS-axis of thick, medium, and thin ice.  
TTTTT<sub>1</sub>, TTTTT<sub>2</sub>, TTTTT<sub>3</sub> = TTTTT-axis of thick, medium, and thin ice.  
UUUUU<sub>1</sub>, UUUUU<sub>2</sub>, UUUUU<sub>3</sub> = UUUUU-axis of thick, medium, and thin ice.  
VVVVV<sub>1</sub>, VVVVV<sub>2</sub>, VVVVV<sub>3</sub> = VVVVV-axis of thick, medium, and thin ice.  
WWWWW<sub>1</sub>, WWWWW<sub>2</sub>, WWWWW<sub>3</sub> = WWWWW-axis of thick, medium, and thin ice.  
XXXXX<sub>1</sub>, XXXXX<sub>2</sub>, XXXXX<sub>3</sub> = XXXXX-axis of thick, medium, and thin ice.  
YYYYY<sub>1</sub>, YYYYY<sub>2</sub>, YYYYY<sub>3</sub> = YYYYY-axis of thick, medium, and thin ice.  
ZZZZZ<sub>1</sub>, ZZZZZ<sub>2</sub>, ZZZZZ<sub>3</sub> = ZZZZZ-axis of thick, medium, and thin ice.









# ANTARCTIC ICE ANALYSIS 1-8 A/10/97

NATIONAL ICE CENTER

DOUGLASSVILLE, TEXAS

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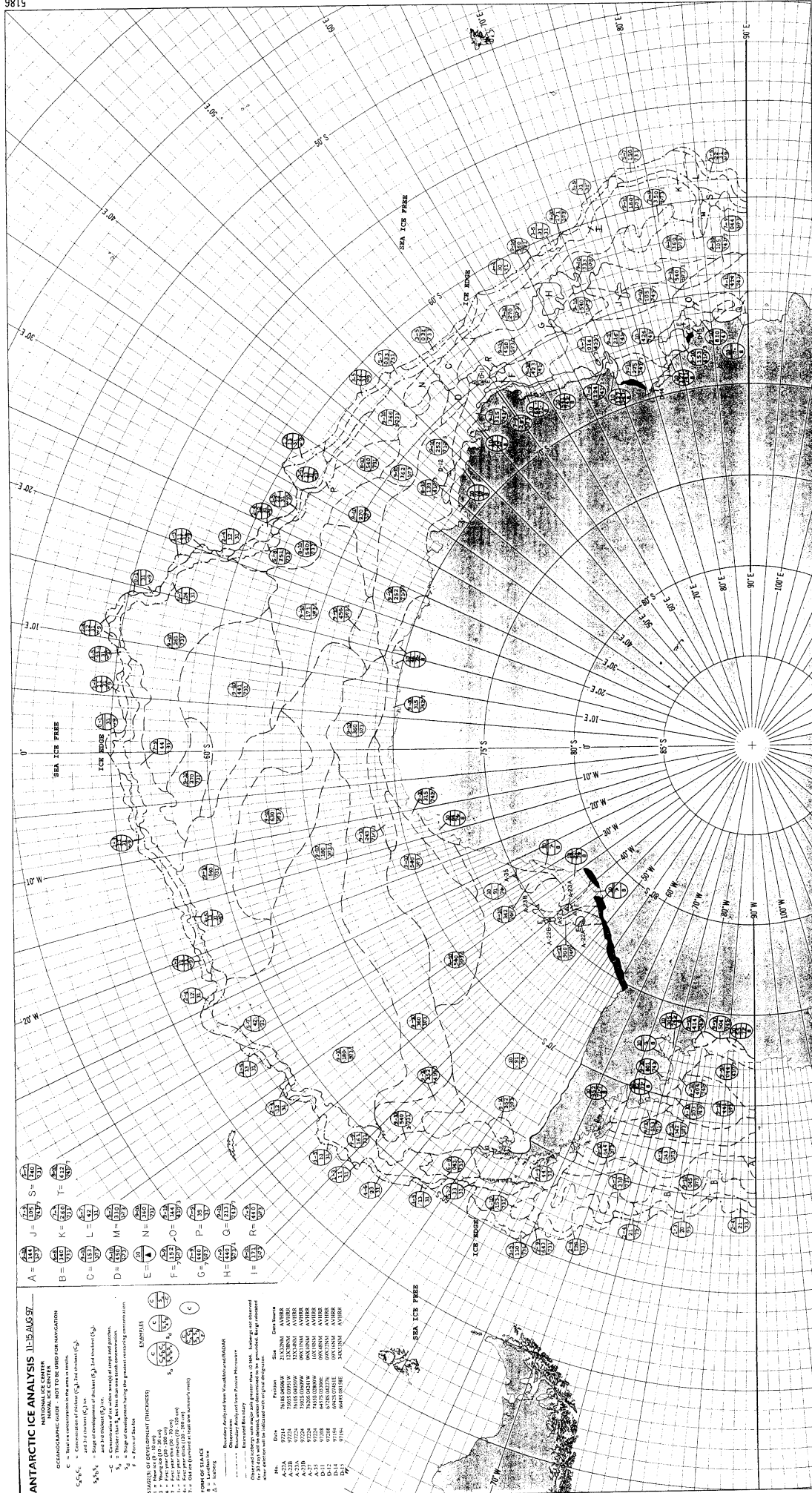
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ANTARCTIC ICE ANALYSIS CHART 5186

NATIONAL ICE CENTER  
OPERATIONAL USE ONLY - NOT TO BE USED FOR NAVIGATION  
C = Sea ice concentration in the area in tenths  
S = Sea ice concentration in the area in tenths  
A = Sea ice concentration in the area in tenths  
B = Sea ice concentration in the area in tenths  
C = Sea ice concentration in the area in tenths  
D = Sea ice concentration in the area in tenths  
E = Sea ice concentration in the area in tenths  
F = Sea ice concentration in the area in tenths  
G = Sea ice concentration in the area in tenths  
H = Sea ice concentration in the area in tenths  
I = Sea ice concentration in the area in tenths  
J = Sea ice concentration in the area in tenths  
K = Sea ice concentration in the area in tenths  
L = Sea ice concentration in the area in tenths  
M = Sea ice concentration in the area in tenths  
N = Sea ice concentration in the area in tenths  
O = Sea ice concentration in the area in tenths  
P = Sea ice concentration in the area in tenths  
Q = Sea ice concentration in the area in tenths  
R = Sea ice concentration in the area in tenths  
S = Sea ice concentration in the area in tenths  
T = Sea ice concentration in the area in tenths  
U = Sea ice concentration in the area in tenths  
V = Sea ice concentration in the area in tenths  
W = Sea ice concentration in the area in tenths  
X = Sea ice concentration in the area in tenths  
Y = Sea ice concentration in the area in tenths  
Z = Sea ice concentration in the area in tenths

EXAMPLES

ICEBERG NAME	LOCATION
A-1	70°S 10°E
A-2	70°S 10°E
A-3	70°S 10°E
A-4	70°S 10°E
A-5	70°S 10°E
A-6	70°S 10°E
A-7	70°S 10°E
A-8	70°S 10°E
A-9	70°S 10°E
A-10	70°S 10°E
A-11	70°S 10°E
A-12	70°S 10°E
A-13	70°S 10°E
A-14	70°S 10°E
A-15	70°S 10°E
A-16	70°S 10°E
A-17	70°S 10°E
A-18	70°S 10°E
A-19	70°S 10°E
A-20	70°S 10°E
A-21	70°S 10°E
A-22	70°S 10°E
A-23	70°S 10°E
A-24	70°S 10°E
A-25	70°S 10°E
A-26	70°S 10°E
A-27	70°S 10°E
A-28	70°S 10°E
A-29	70°S 10°E
A-30	70°S 10°E
A-31	70°S 10°E
A-32	70°S 10°E
A-33	70°S 10°E
A-34	70°S 10°E
A-35	70°S 10°E
A-36	70°S 10°E
A-37	70°S 10°E
A-38	70°S 10°E
A-39	70°S 10°E
A-40	70°S 10°E
A-41	70°S 10°E
A-42	70°S 10°E
A-43	70°S 10°E
A-44	70°S 10°E
A-45	70°S 10°E
A-46	70°S 10°E
A-47	70°S 10°E
A-48	70°S 10°E
A-49	70°S 10°E
A-50	70°S 10°E
A-51	70°S 10°E
A-52	70°S 10°E
A-53	70°S 10°E
A-54	70°S 10°E
A-55	70°S 10°E
A-56	70°S 10°E
A-57	70°S 10°E
A-58	70°S 10°E
A-59	70°S 10°E
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A-68	70°S 10°E
A-69	70°S 10°E
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A-71	70°S 10°E
A-72	70°S 10°E
A-73	70°S 10°E
A-74	70°S 10°E
A-75	70°S 10°E
A-76	70°S 10°E
A-77	70°S 10°E
A-78	70°S 10°E
A-79	70°S 10°E
A-80	70°S 10°E
A-81	70°S 10°E
A-82	70°S 10°E
A-83	70°S 10°E
A-84	70°S 10°E
A-85	70°S 10°E
A-86	70°S 10°E
A-87	70°S 10°E
A-88	70°S 10°E
A-89	70°S 10°E
A-90	70°S 10°E
A-91	70°S 10°E
A-92	70°S 10°E
A-93	70°S 10°E
A-94	70°S 10°E
A-95	70°S 10°E
A-96	70°S 10°E
A-97	70°S 10°E
A-98	70°S 10°E
A-99	70°S 10°E
A-100	70°S 10°E

STAGES OF DEVELOPMENT (THICKNESS)

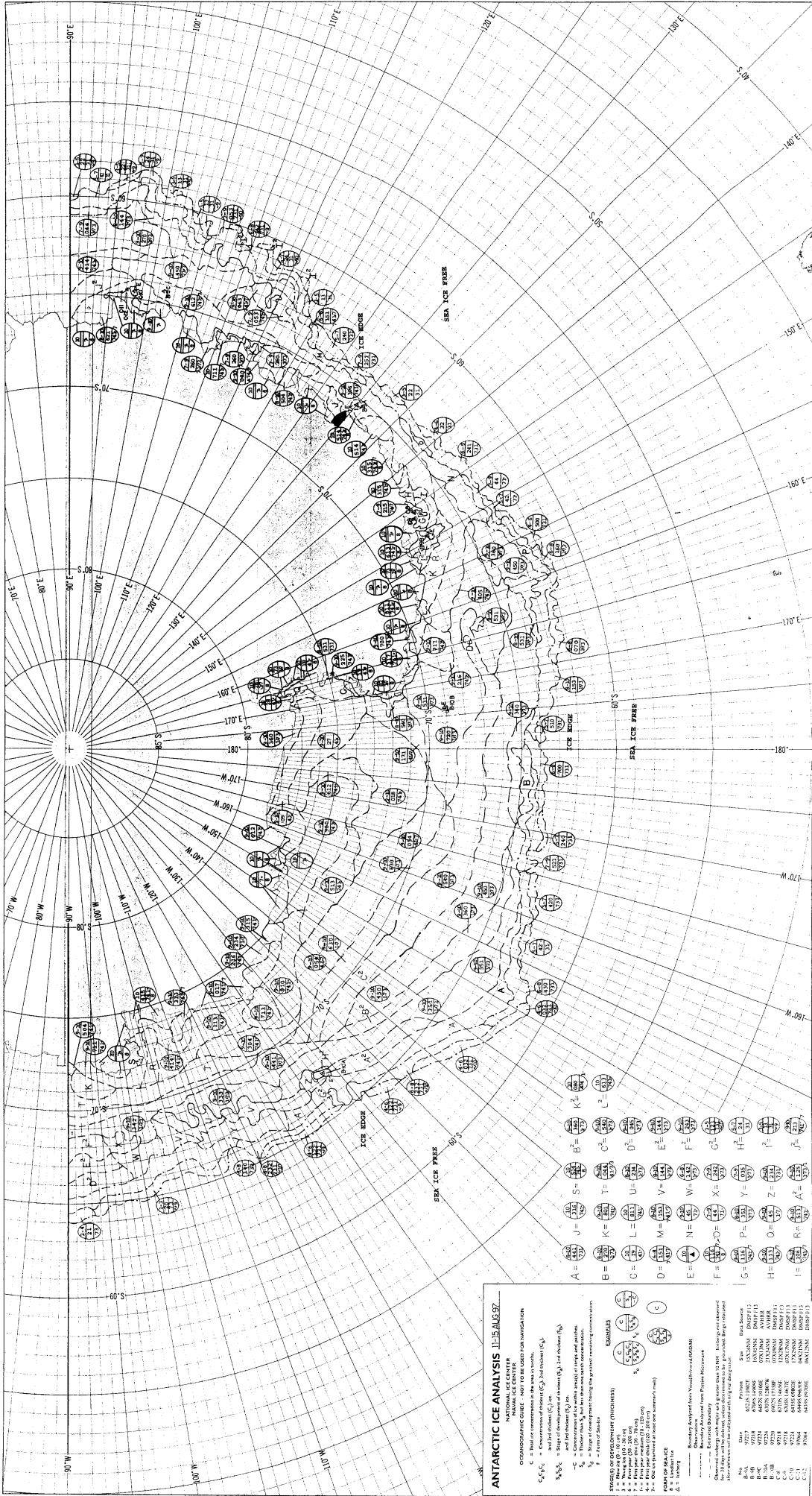
1 = Thin ice (10-15 cm)  
2 = Thin ice (15-20 cm)  
3 = Thin ice (20-25 cm)  
4 = Thin ice (25-30 cm)  
5 = Thin ice (30-35 cm)  
6 = Thin ice (35-40 cm)  
7 = Thin ice (40-45 cm)  
8 = Thin ice (45-50 cm)  
9 = Thin ice (50-55 cm)  
10 = Thin ice (55-60 cm)  
11 = Thin ice (60-65 cm)  
12 = Thin ice (65-70 cm)  
13 = Thin ice (70-75 cm)  
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97 = Thin ice (490-495 cm)  
98 = Thin ice (495-500 cm)  
99 = Thin ice (500-505 cm)  
100 = Thin ice (505-510 cm)

STAGES OF DEVELOPMENT (THICKNESS)

1 = Thin ice (10-15 cm)  
2 = Thin ice (15-20 cm)  
3 = Thin ice (20-25 cm)  
4 = Thin ice (25-30 cm)  
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12 = Thin ice (65-70 cm)  
13 = Thin ice (70-75 cm)  
14 = Thin ice (75-80 cm)  
15 = Thin ice (80-85 cm)  
16 = Thin ice (85-90 cm)  
17 = Thin ice (90-95 cm)  
18 = Thin ice (95-100 cm)  
19 = Thin ice (100-105 cm)  
20 = Thin ice (105-110 cm)  
21 = Thin ice (110-115 cm)  
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23 = Thin ice (120-125 cm)  
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35 = Thin ice (180-185 cm)  
36 = Thin ice (185-190 cm)  
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39 = Thin ice (200-205 cm)  
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41 = Thin ice (210-215 cm)  
42 = Thin ice (215-220 cm)  
43 = Thin ice (220-225 cm)  
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52 = Thin ice (265-270 cm)  
53 = Thin ice (270-275 cm)  
54 = Thin ice (275-280 cm)  
55 = Thin ice (280-285 cm)  
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57 = Thin ice (290-295 cm)  
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64 = Thin ice (325-330 cm)  
65 = Thin ice (330-335 cm)  
66 = Thin ice (335-340 cm)  
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83 = Thin ice (420-425 cm)  
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97 = Thin ice (490-495 cm)  
98 = Thin ice (495-500 cm)  
99 = Thin ice (500-505 cm)  
100 = Thin ice (505-510 cm)

STAGES OF DEVELOPMENT (THICKNESS)

1 = Thin ice (10-15 cm)  
2 = Thin ice (15-20 cm)  
3 = Thin ice (20-25 cm)  
4 = Thin ice (25-30 cm)  
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95 = Thin ice (480-485 cm)  
96 = Thin ice (485-490 cm)  
97 = Thin ice (490-495 cm)  
98 = Thin ice (495-500 cm)  
99 = Thin ice (500-505 cm)  
100 = Thin ice (505-510 cm)



ANTARCTIC ICE ANALYSIS 11-15 AUG 97

NATIONAL ICE CENTER  
NAVY, WASHINGTON, D.C. 20375-5000

ORGANIZATIONAL CHART FOR NAVIGATION

C = Total ice concentration in the area in north.

$C_1, C_2, C_3$  = Concentrations of ice types  $C_1, C_2$  and  $C_3$ .

$C_1, C_2, C_3$  = Concentrations of ice types  $C_1, C_2$  and  $C_3$ .

$C_1, C_2, C_3$  = Concentrations of ice types  $C_1, C_2$  and  $C_3$ .

$C_1, C_2, C_3$  = Concentrations of ice types  $C_1, C_2$  and  $C_3$ .

$C_1, C_2, C_3$  = Concentrations of ice types  $C_1, C_2$  and  $C_3$ .

$C_1, C_2, C_3$  = Concentrations of ice types  $C_1, C_2$  and  $C_3$ .

$C_1, C_2, C_3$  = Concentrations of ice types  $C_1, C_2$  and  $C_3$ .

$C_1, C_2, C_3$  = Concentrations of ice types  $C_1, C_2$  and  $C_3$ .

$C_1, C_2, C_3$  = Concentrations of ice types  $C_1, C_2$  and  $C_3$ .

$C_1, C_2, C_3$  = Concentrations of ice types  $C_1, C_2$  and  $C_3$ .

$C_1, C_2, C_3$  = Concentrations of ice types  $C_1, C_2$  and  $C_3$ .

$C_1, C_2, C_3$  = Concentrations of ice types  $C_1, C_2$  and  $C_3$ .

$C_1, C_2, C_3$  = Concentrations of ice types  $C_1, C_2$  and  $C_3$ .

$C_1, C_2, C_3$  = Concentrations of ice types  $C_1, C_2$  and  $C_3$ .

$C_1, C_2, C_3$  = Concentrations of ice types  $C_1, C_2$  and  $C_3$ .

$C_1, C_2, C_3$  = Concentrations of ice types  $C_1, C_2$  and  $C_3$ .

$C_1, C_2, C_3$  = Concentrations of ice types  $C_1, C_2$  and  $C_3$ .

$C_1, C_2, C_3$  = Concentrations of ice types  $C_1, C_2$  and  $C_3$ .

$C_1, C_2, C_3$  = Concentrations of ice types  $C_1, C_2$  and  $C_3$ .

$C_1, C_2, C_3$  = Concentrations of ice types  $C_1, C_2$  and  $C_3$ .

$C_1, C_2, C_3$  = Concentrations of ice types  $C_1, C_2$  and  $C_3$ .

$C_1, C_2, C_3$  = Concentrations of ice types  $C_1, C_2$  and  $C_3$ .

$C_1, C_2, C_3$  = Concentrations of ice types  $C_1, C_2$  and  $C_3$ .

$C_1, C_2, C_3$  = Concentrations of ice types  $C_1, C_2$  and  $C_3$ .

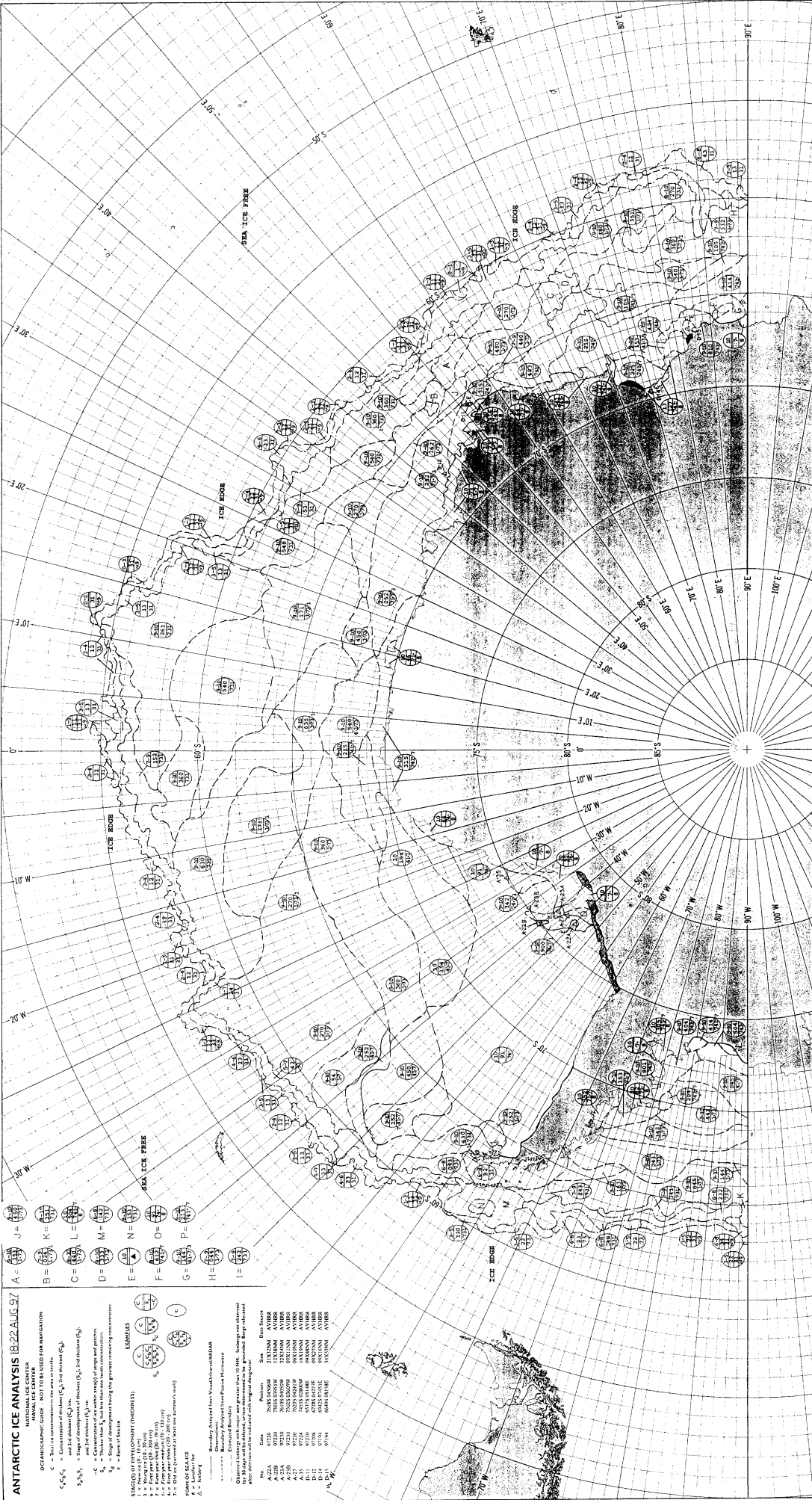
$C_1, C_2, C_3$  = Concentrations of ice types  $C_1, C_2$  and  $C_3$ .

$C_1, C_2, C_3$  = Concentrations of ice types  $C_1, C_2$  and  $C_3$ .

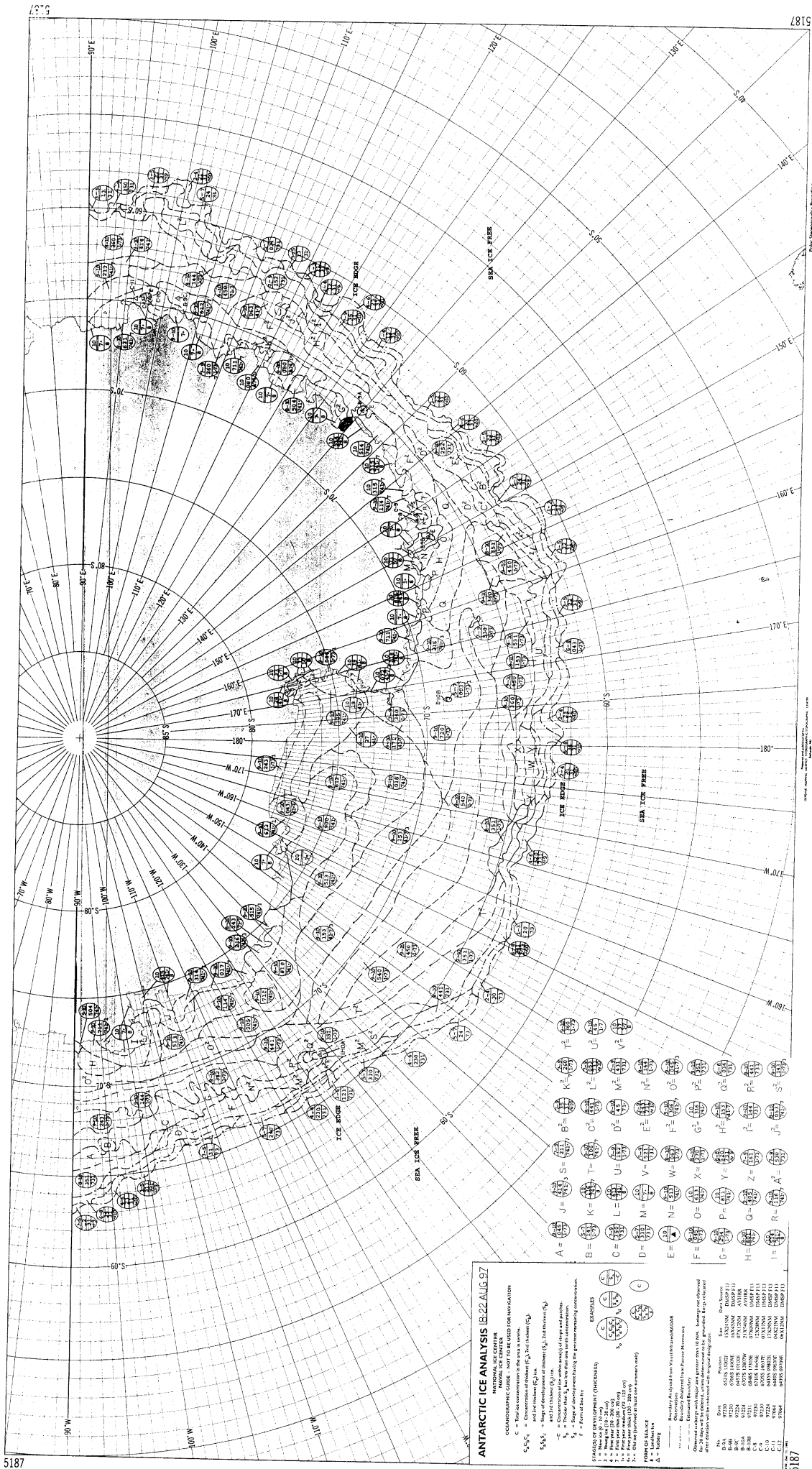
$C_1, C_2, C_3$  = Concentrations of ice types  $C_1, C_2$  and  $C_3$ .

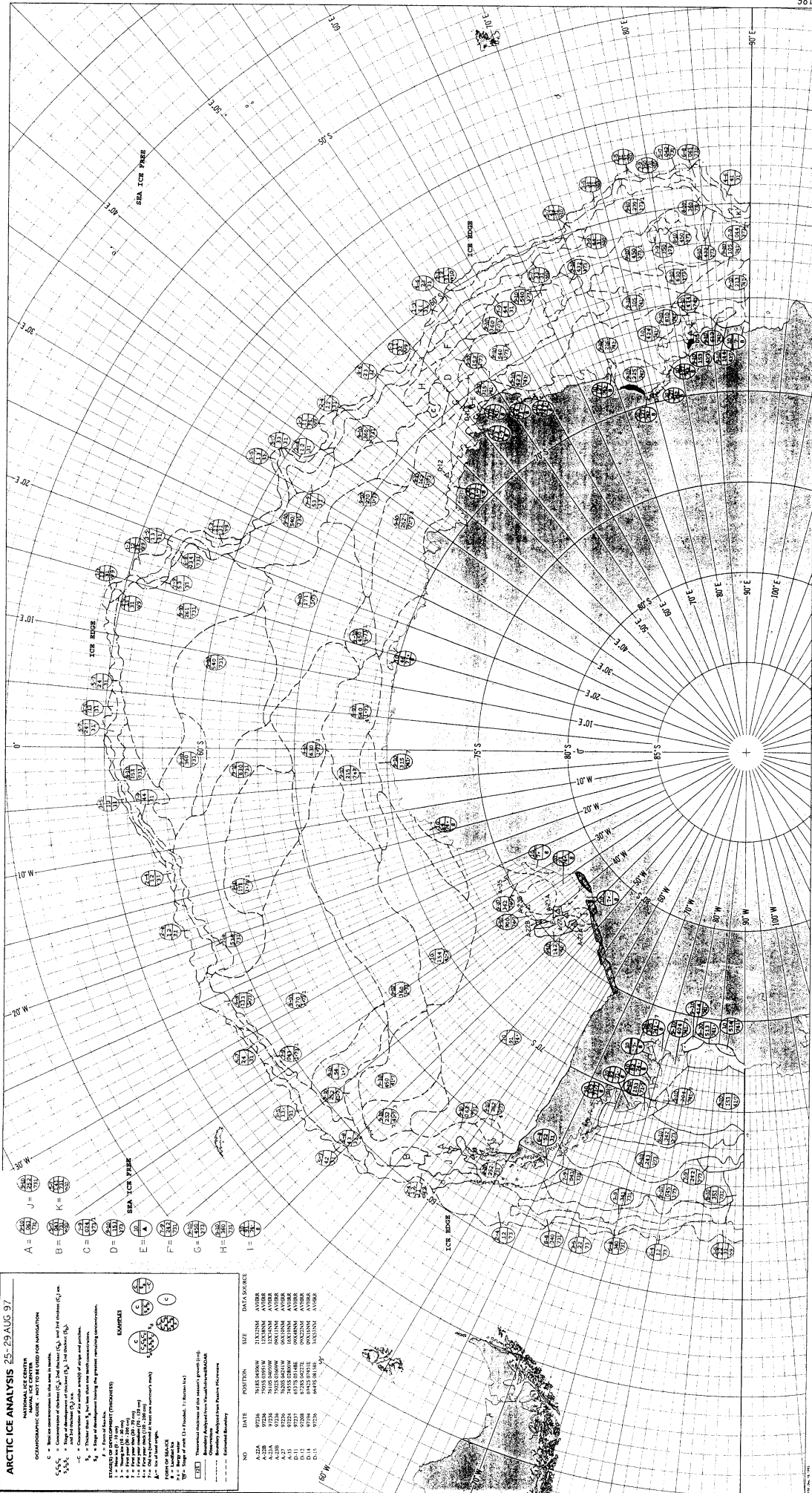
$C_1, C_2, C_3$  = Concentrations of ice types  $C_1, C_2$  and  $C_3$ .

$C_1, C_2, C_3$  = Concentrations of ice types  $C_1, C_2$  and  $C_3$ .















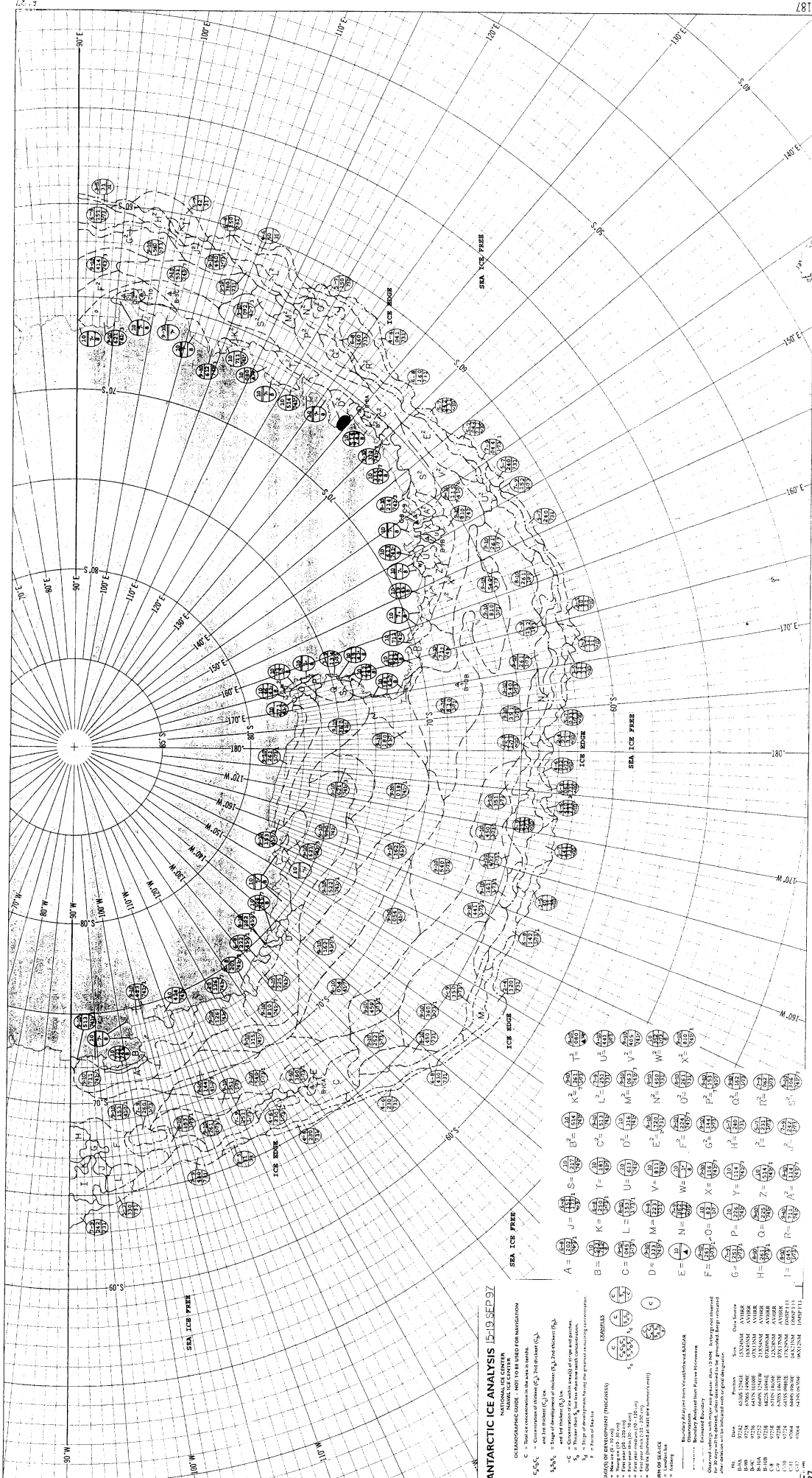










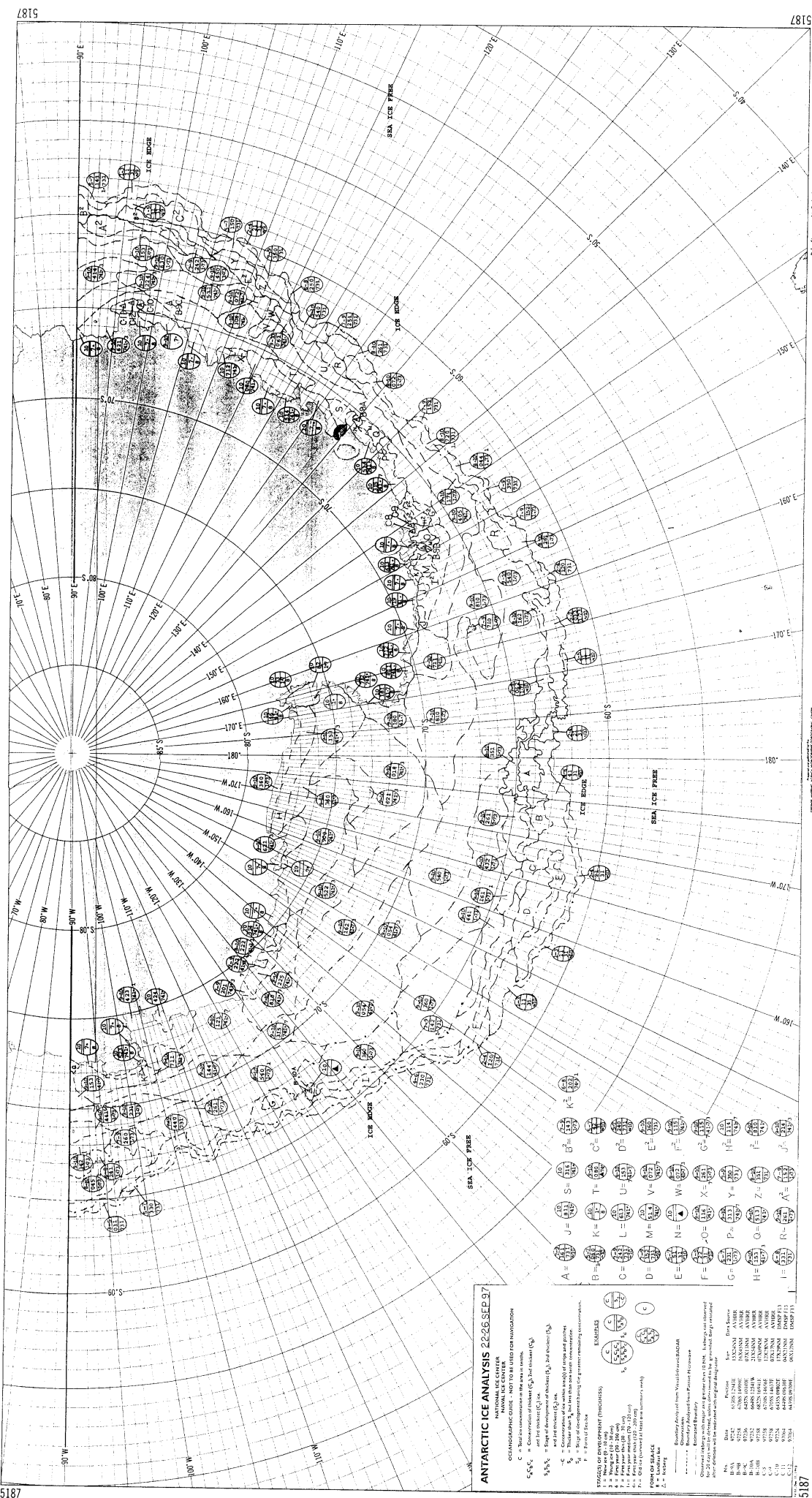


ANTARCTIC ICE ANALYSIS 15-19 SEP 97

NATIONAL ICE CENTER  
NAVAL ICE CENTER

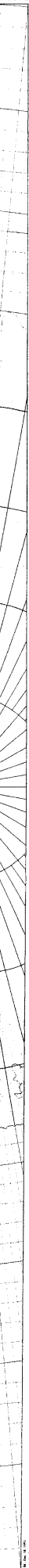
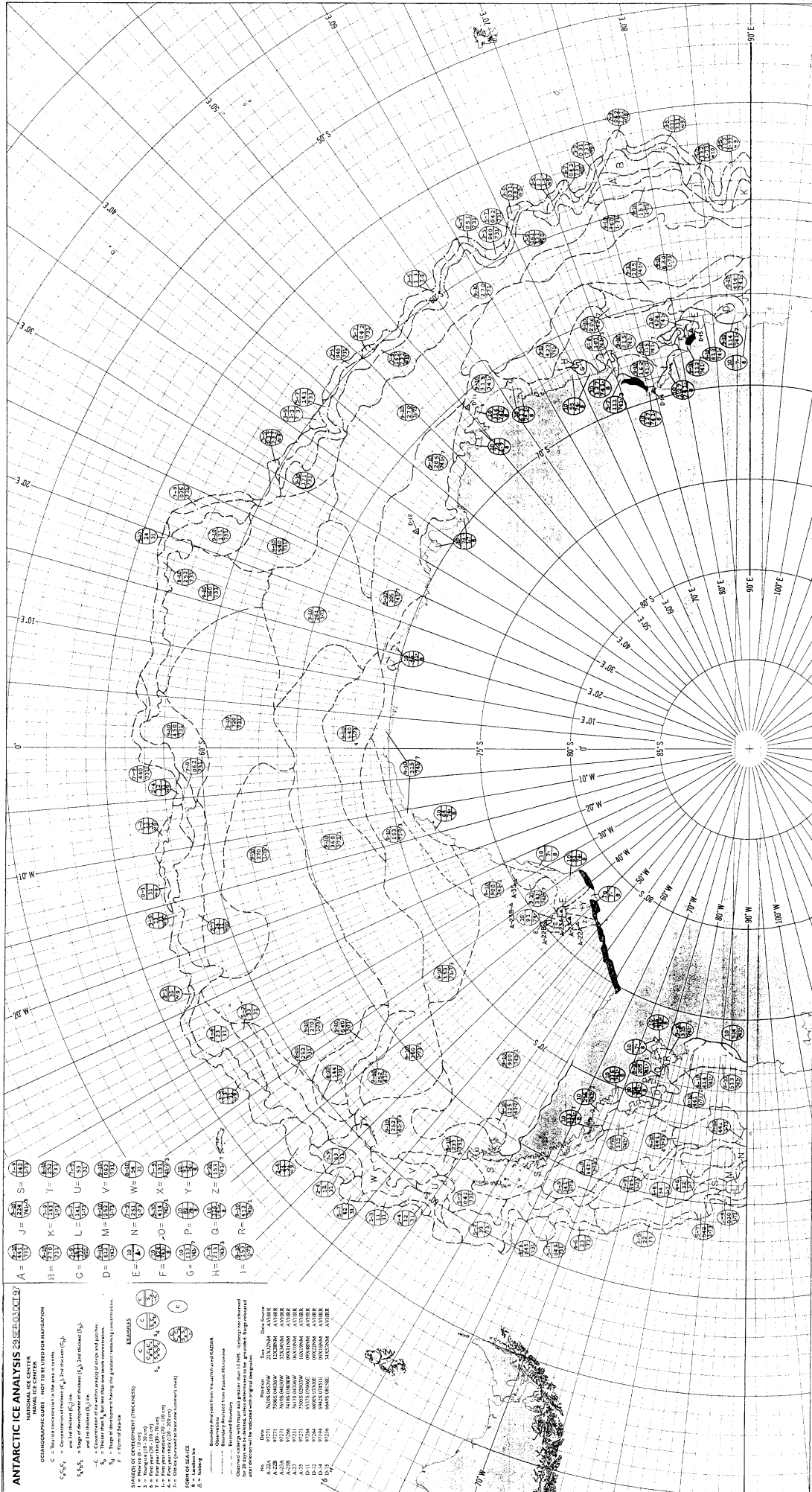


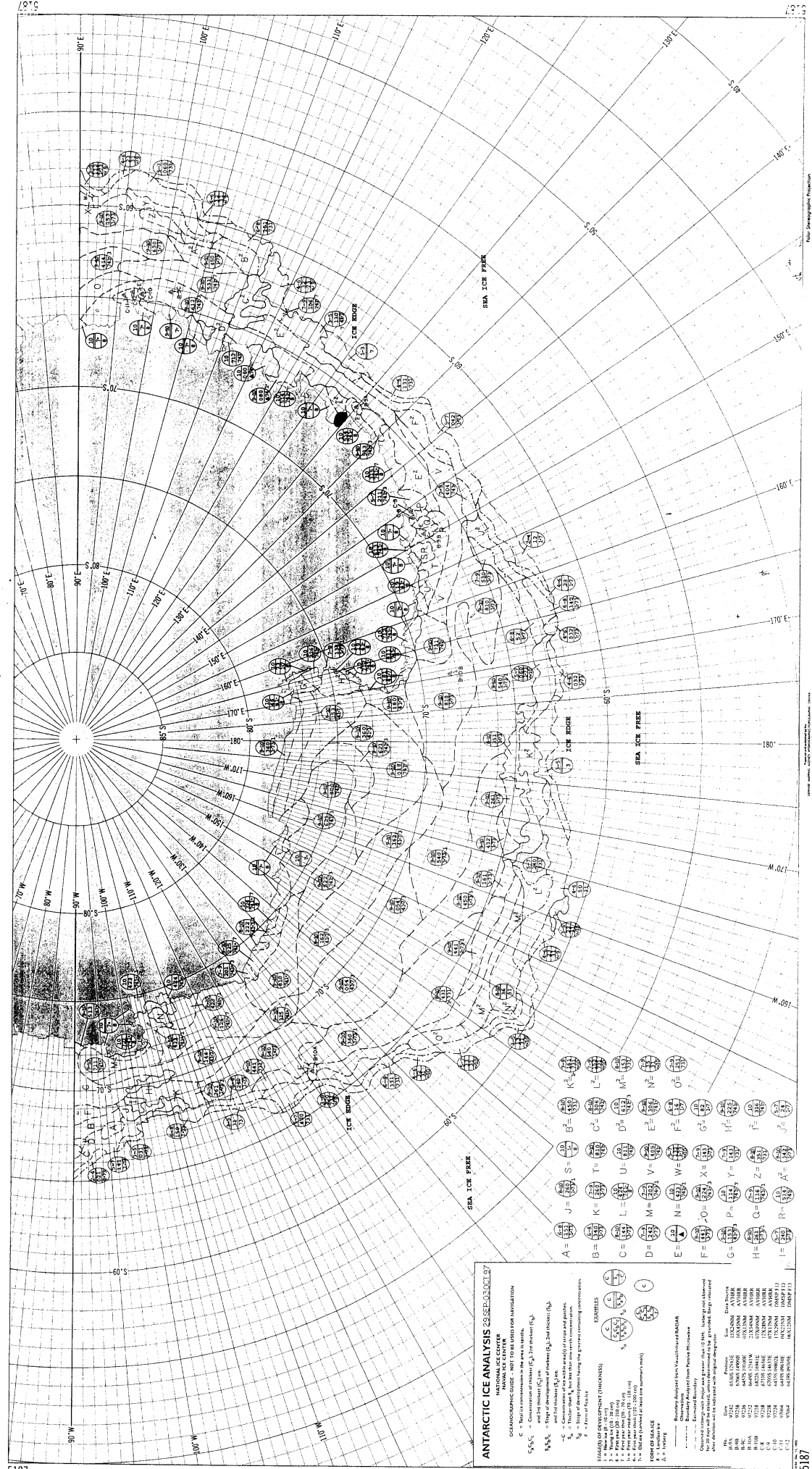


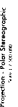


ANTARCTIC ICE ANALYSIS 22-26 SEP 97

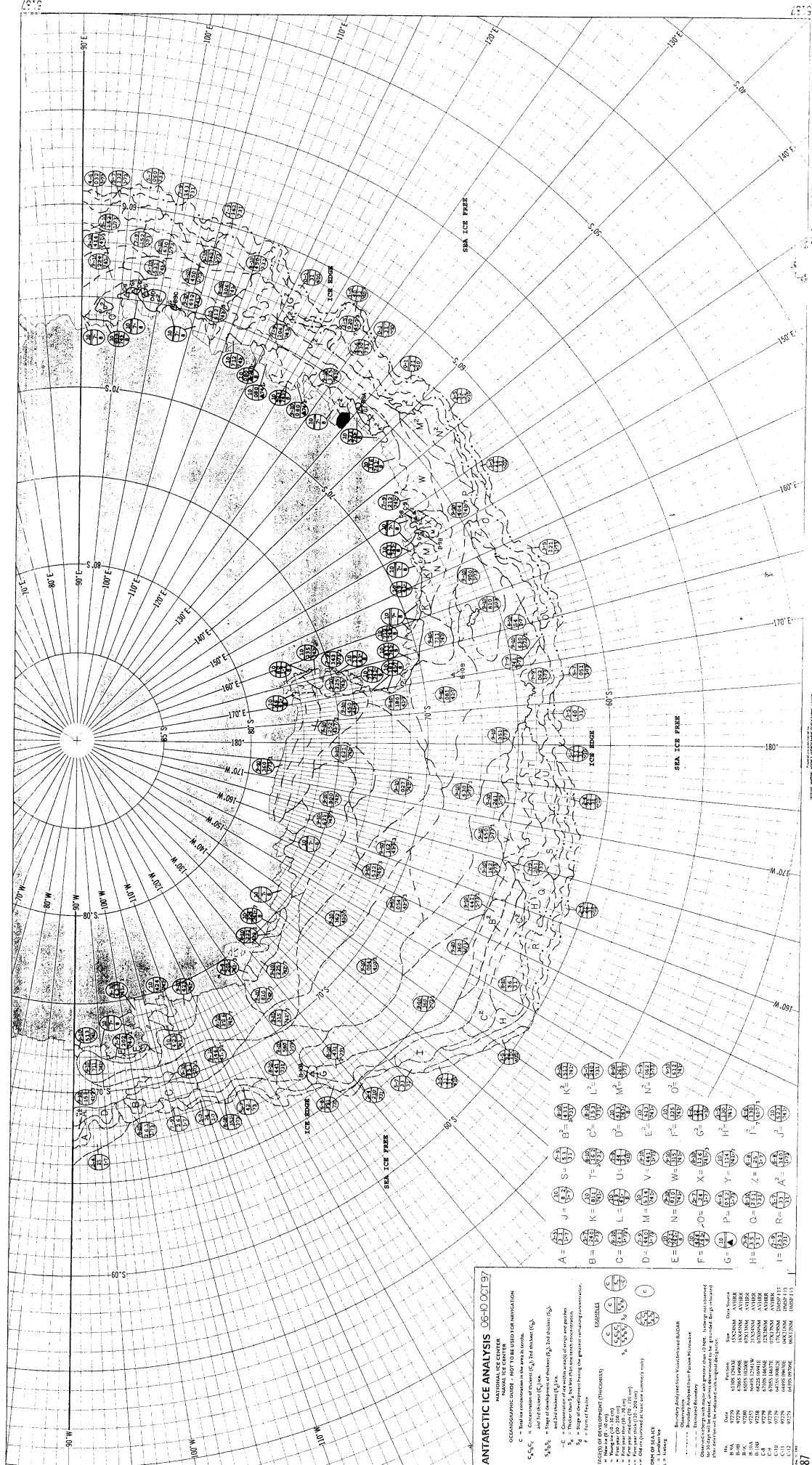
NATIONAL ICE CENTER  
OCEANOGRAPHIC DATA - NOT FOR NAVIGATION  
C = Total ice concentration in the area in units.  
C<sub>1</sub>C<sub>2</sub>C<sub>3</sub> = Concentration of thickest (C<sub>1</sub>), 2nd thickest (C<sub>2</sub>) and 3rd thickest (C<sub>3</sub>) ice.  
S<sub>1</sub>S<sub>2</sub>S<sub>3</sub> = Size of icebergs (S<sub>1</sub>), 2nd largest (S<sub>2</sub>) and 3rd largest (S<sub>3</sub>).  
S<sub>1</sub> = Concentration of icebergs in the area in units.  
S<sub>2</sub> = Concentration of icebergs in the area in units.  
S<sub>3</sub> = Concentration of icebergs in the area in units.  
S<sub>4</sub> = Degree of development (1-4) for icebergs remaining concentration.  
P = Form of icebergs.  
STAGES OF DEVELOPMENT (THICKNESS)  
1 = Young ice (10-30 cm)  
2 = First-year ice (30-100 cm)  
3 = Second-year ice (100-200 cm)  
4 = Third-year ice (200-300 cm)  
5 = Fourth-year ice (300-400 cm)  
6 = Fifth-year ice (400-500 cm)  
7 = Sixth-year ice (500-600 cm)  
8 = Seventh-year ice (600-700 cm)  
9 = Eighth-year ice (700-800 cm)  
10 = Ninth-year ice (800-900 cm)  
11 = Tenth-year ice (900-1000 cm)  
12 = Eleventh-year ice (1000-1100 cm)  
13 = Twelfth-year ice (1100-1200 cm)  
14 = Thirteenth-year ice (1200-1300 cm)  
15 = Fourteenth-year ice (1300-1400 cm)  
16 = Fifteenth-year ice (1400-1500 cm)  
17 = Sixteenth-year ice (1500-1600 cm)  
18 = Seventeenth-year ice (1600-1700 cm)  
19 = Eighteenth-year ice (1700-1800 cm)  
20 = Nineteenth-year ice (1800-1900 cm)  
21 = Twentieth-year ice (1900-2000 cm)  
22 = Twenty-first-year ice (2000-2100 cm)  
23 = Twenty-second-year ice (2100-2200 cm)  
24 = Twenty-third-year ice (2200-2300 cm)  
25 = Twenty-fourth-year ice (2300-2400 cm)  
26 = Twenty-fifth-year ice (2400-2500 cm)  
27 = Twenty-sixth-year ice (2500-2600 cm)  
28 = Twenty-seventh-year ice (2600-2700 cm)  
29 = Twenty-eighth-year ice (2700-2800 cm)  
30 = Twenty-ninth-year ice (2800-2900 cm)  
31 = Thirtieth-year ice (2900-3000 cm)  
32 = Thirty-first-year ice (3000-3100 cm)  
33 = Thirty-second-year ice (3100-3200 cm)  
34 = Thirty-third-year ice (3200-3300 cm)  
35 = Thirty-fourth-year ice (3300-3400 cm)  
36 = Thirty-fifth-year ice (3400-3500 cm)  
37 = Thirty-sixth-year ice (3500-3600 cm)  
38 = Thirty-seventh-year ice (3600-3700 cm)  
39 = Thirty-eighth-year ice (3700-3800 cm)  
40 = Thirty-ninth-year ice (3800-3900 cm)  
41 = Fortieth-year ice (3900-4000 cm)  
42 = Forty-first-year ice (4000-4100 cm)  
43 = Forty-second-year ice (4100-4200 cm)  
44 = Forty-third-year ice (4200-4300 cm)  
45 = Forty-fourth-year ice (4300-4400 cm)  
46 = Forty-fifth-year ice (4400-4500 cm)  
47 = Forty-sixth-year ice (4500-4600 cm)  
48 = Forty-seventh-year ice (4600-4700 cm)  
49 = Forty-eighth-year ice (4700-4800 cm)  
50 = Forty-ninth-year ice (4800-4900 cm)  
51 = Fiftieth-year ice (4900-5000 cm)  
52 = Fifty-first-year ice (5000-5100 cm)  
53 = Fifty-second-year ice (5100-5200 cm)  
54 = Fifty-third-year ice (5200-5300 cm)  
55 = Fifty-fourth-year ice (5300-5400 cm)  
56 = Fifty-fifth-year ice (5400-5500 cm)  
57 = Fifty-sixth-year ice (5500-5600 cm)  
58 = Fifty-seventh-year ice (5600-5700 cm)  
59 = Fifty-eighth-year ice (5700-5800 cm)  
60 = Fifty-ninth-year ice (5800-5900 cm)  
61 = Sixtieth-year ice (5900-6000 cm)  
62 = Sixty-first-year ice (6000-6100 cm)  
63 = Sixty-second-year ice (6100-6200 cm)  
64 = Sixty-third-year ice (6200-6300 cm)  
65 = Sixty-fourth-year ice (6300-6400 cm)  
66 = Sixty-fifth-year ice (6400-6500 cm)  
67 = Sixty-sixth-year ice (6500-6600 cm)  
68 = Sixty-seventh-year ice (6600-6700 cm)  
69 = Sixty-eighth-year ice (6700-6800 cm)  
70 = Sixty-ninth-year ice (6800-6900 cm)  
71 = Seventieth-year ice (6900-7000 cm)  
72 = Seventy-first-year ice (7000-7100 cm)  
73 = Seventy-second-year ice (7100-7200 cm)  
74 = Seventy-third-year ice (7200-7300 cm)  
75 = Seventy-fourth-year ice (7300-7400 cm)  
76 = Seventy-fifth-year ice (7400-7500 cm)  
77 = Seventy-sixth-year ice (7500-7600 cm)  
78 = Seventy-seventh-year ice (7600-7700 cm)  
79 = Seventy-eighth-year ice (7700-7800 cm)  
80 = Seventy-ninth-year ice (7800-7900 cm)  
81 = Eightieth-year ice (7900-8000 cm)  
82 = Eighty-first-year ice (8000-8100 cm)  
83 = Eighty-second-year ice (8100-8200 cm)  
84 = Eighty-third-year ice (8200-8300 cm)  
85 = Eighty-fourth-year ice (8300-8400 cm)  
86 = Eighty-fifth-year ice (8400-8500 cm)  
87 = Eighty-sixth-year ice (8500-8600 cm)  
88 = Eighty-seventh-year ice (8600-8700 cm)  
89 = Eighty-eighth-year ice (8700-8800 cm)  
90 = Eighty-ninth-year ice (8800-8900 cm)  
91 = Ninetieth-year ice (8900-9000 cm)  
92 = Ninety-first-year ice (9000-9100 cm)  
93 = Ninety-second-year ice (9100-9200 cm)  
94 = Ninety-third-year ice (9200-9300 cm)  
95 = Ninety-fourth-year ice (9300-9400 cm)  
96 = Ninety-fifth-year ice (9400-9500 cm)  
97 = Ninety-sixth-year ice (9500-9600 cm)  
98 = Ninety-seventh-year ice (9600-9700 cm)  
99 = Ninety-eighth-year ice (9700-9800 cm)  
100 = Ninety-ninth-year ice (9800-9900 cm)  
101 = One hundredth-year ice (9900-10000 cm)











### ANTARCTIC ICE ANALYSIS 06-10-00T 97

**NATIONAL ICE CENTER**  
**OCEANOGRAPHIC CODE - NOT TO BE USED FOR NAVIGATION**

$C =$  Total ice concentration in the area is known.  
 $C_1, C_2, C_3 =$  Concentration of ice types  $C_1, C_2$  and thickness  $C_3$   
 $S_1, S_2, S_3 =$  Stage of development of ice types  $S_1, S_2$  and thickness  $S_3$   
 $T_1, T_2, T_3 =$  Thickness of ice types  $T_1, T_2$  and thickness  $T_3$   
 $P =$  Ice type  $P$   
 $R =$  Range of development from the greatest remaining concentration

**EXAMPLES**

$C_1 = \frac{1}{2} \frac{1}{2} \frac{1}{2}$   $C_2 = \frac{1}{2} \frac{1}{2} \frac{1}{2}$   $C_3 = \frac{1}{2} \frac{1}{2} \frac{1}{2}$   $C_4 = \frac{1}{2} \frac{1}{2} \frac{1}{2}$   $C_5 = \frac{1}{2} \frac{1}{2} \frac{1}{2}$   $C_6 = \frac{1}{2} \frac{1}{2} \frac{1}{2}$   $C_7 = \frac{1}{2} \frac{1}{2} \frac{1}{2}$   $C_8 = \frac{1}{2} \frac{1}{2} \frac{1}{2}$   $C_9 = \frac{1}{2} \frac{1}{2} \frac{1}{2}$   $C_{10} = \frac{1}{2} \frac{1}{2} \frac{1}{2}$

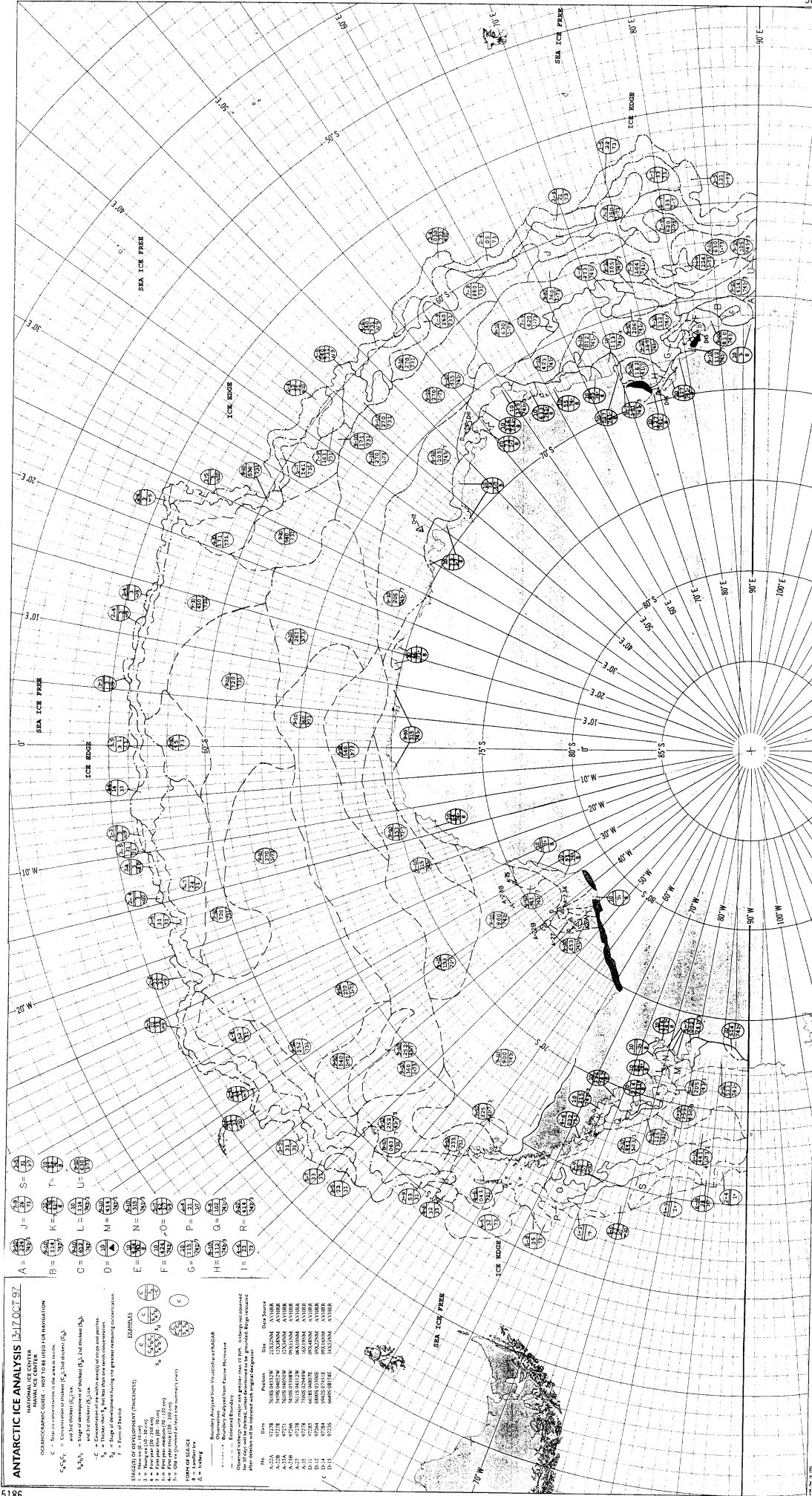
**LEGEND**

$C =$  Concentration of ice types  $C_1, C_2$  and thickness  $C_3$   
 $S =$  Stage of development of ice types  $S_1, S_2$  and thickness  $S_3$   
 $T =$  Thickness of ice types  $T_1, T_2$  and thickness  $T_3$   
 $P =$  Ice type  $P$   
 $R =$  Range of development from the greatest remaining concentration

**FORM OF SEA ICE**

$A =$  Land ice  
 $B =$  Sea ice  
 $C =$  Ice edge  
 $D =$  Ice edge  
 $E =$  Ice edge  
 $F =$  Ice edge  
 $G =$  Ice edge  
 $H =$  Ice edge  
 $I =$  Ice edge  
 $J =$  Ice edge  
 $K =$  Ice edge  
 $L =$  Ice edge  
 $M =$  Ice edge  
 $N =$  Ice edge  
 $O =$  Ice edge  
 $P =$  Ice edge  
 $Q =$  Ice edge  
 $R =$  Ice edge  
 $S =$  Ice edge  
 $T =$  Ice edge  
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 $V =$  Ice edge  
 $W =$  Ice edge  
 $X =$  Ice edge  
 $Y =$  Ice edge  
 $Z =$  Ice edge  
 $A =$  Ice edge  
 $B =$  Ice edge  
 $C =$  Ice edge  
 $D =$  Ice edge  
 $E =$  Ice edge  
 $F =$  Ice edge  
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 $P =$  Ice edge  
 $Q =$  Ice edge  
 $R =$  Ice edge  
 $S =$  Ice edge  
 $T =$  Ice edge  
 $U =$  Ice edge  
 $V =$  Ice edge  
 $W =$  Ice edge  
 $X =$  Ice edge  
 $Y =$  Ice edge  
 $Z =$  Ice edge





**ANTARCTIC ICE ANALYSIS 1317 OCT 97**

**NAVAL ICE CENTER**

**SYMBOLS:**

- ICE EDGE** - Line of ice edge (solid line)
- SEA ICE FREE** - Area of sea ice free (dashed line)
- ICE ROUGH** - Area of ice rough (dotted line)

**STAGES OF DEVELOPMENT (THICKNESS):**

- 1** - New ice (0-10 cm)
- 2** - Thin ice (10-20 cm)
- 3** - First year ice (20-100 cm)
- 4** - Second year ice (100-200 cm)
- 5** - Old ice (200 cm or more)

**EXAMPLES:**

- A** - Ice edge (solid line)
- B** - Sea ice free (dashed line)
- C** - Ice rough (dotted line)
- D** - Ice edge (solid line)
- E** - Sea ice free (dashed line)
- F** - Ice rough (dotted line)
- G** - Ice edge (solid line)
- H** - Sea ice free (dashed line)
- I** - Ice rough (dotted line)

**LEGEND:**

- 1** - New ice (0-10 cm)
- 2** - Thin ice (10-20 cm)
- 3** - First year ice (20-100 cm)
- 4** - Second year ice (100-200 cm)
- 5** - Old ice (200 cm or more)

**NOTES:**

- Boundary defined from Visual Ice or RADAR
- Observed thickness with major sea areas less than 10 feet. Unobserved thicknesses are indicated with appropriate symbols.



